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## Olmsted Horse Wicket Experiment in 1:5-Scale Hydraulic Flume Model

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# **Olmsted Horse Wicket Experiment in 1:5-Scale Hydraulic Flume Model**

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# Preface

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The research reported herein was sponsored by the U.S. Army Engineer District, Louisville (USAED, Louisville), in support of the Olmsted Navigational Model Study Program. Mr. Rick Schultz, Louisville District, was the Program Monitor for the physical model studies.

All work was carried out by Dr. Mostafiz R. Chowdhury, Structural Mechanics Branch (SMB), Geotechnical and Structures Laboratory (GSL), U.S. Army Engineer Research and Development Center (ERDC), under the general supervision of Dr. Michael J. O'Connor, Director, GSL; and Dr. Robert L. Hall, Chief, Geosciences and Structures Division; and Mr. Frank Dallriva, Chief, SMB; and Mr. Winston Glenn Davis, Hydraulic Structures Division (HSD), Coastal and Hydraulics Laboratory (CHL), ERDC, under the general supervision of Mr. Tom Richardson, Acting Director, CHL; Mr. Tom Pokrefke, Assistant Director, CHL; and Mr. James R. Leech, Chief, Spillways and Channels Branch. The work was conducted during May 1999 through March 2001 under the direct supervision of Dr. Chowdhury and Mr. Davis.

Mr. Ken Vitaya-udom, GSL, prepared the model shop drawings. Mr. Bill W. Tennant, Welding Shop, ERDC, and Mr. Robert D. Parman, Machine Shop, ERDC, are credited for fabrication of the horse wicket gate. Mr. Joe Ables, Ables Electronics, Vicksburg, MS, was responsible for instrumentation and data acquisition during experiments. Mr. David Mobley, HSD, coordinated the operation of the model experiments. Mr. Terry W. Warren, Information Technology Laboratory (ITL), analyzed data, and Mr. Homer C. Greer, ITL, was responsible for coordinating instrumentation and data acquisition tasks. The efforts of the Editorial Section and Visual Production Center, ITL, staff members who participated in the preparation of the report are appreciated.

At the time of publication of this report, Dr. James R. Houston was Director, and COL John W. Morris III, EN, was Commander and Executive Director.

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# Conversion Factors, Non-SI to SI Units of Measurement

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Non-SI units of measurement used in this report can be converted to SI units as follows:

Multiply	By	To Obtain
cubic feet	0.02831685	cubic metres
cubic inches	0.000016387	cubic metres
degrees (angle)	0.01745329	radians
Fahrenheit degrees	5/9	Celsius degrees <sup>1</sup>
feet	0.3048	metres
g (standard acceleration of free fall)	9.80665	metres per second squared
inches	0.0254	metres
ksi (kips per square inch)	6.894757	megapascals
kips	4.4484	kilonewtons
microinch	0.0000000254	metres
pounds (force)	4.4484	newtons
pounds (mass)	0.4535924	kilograms
pounds (force) per square inch	0.006894757	megapascals
tons	1,000	kilograms
<sup>1</sup> To obtain Celsius ( C ) temperature readings from Fahrenheit (F) readings, use the equation: C = (5/9) – (F – 32).		

# 1 Introduction

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## Background

The U.S. Army Engineering Research and Development Center (ERDC), Vicksburg, MS, site, has been involved in determining the adequacy, operability, and constructibility of the current horse-style wicket being designed for the Olmsted Locks and Dam (L&D) project and to evaluate the functional behavior of the proposed horse wicket for the anticipated service conditions.<sup>1</sup> A series of 1:5-scale horse wicket model experiments were conducted at the existing 1:5 model facility at ERDC. The experimental data presented in this document support the design development of the prototype horse wicket for the Olmsted Dam.

The proposed Olmsted Dam will replace two existing Locks and Dams on the lower Ohio River (L&D 52 and 53). The new dam will consist of twin 1,200-ft-long by 110-ft-wide navigation locks, five tainter gate bays, and approximately a 1,400-ft-wide navigable pass.<sup>2</sup> The navigable pass portion of the dam will use wicket gates to facilitate the barge/tow traffic approximately 60 percent of a given year. During low flow periods, the wicket gates will be raised to provide navigable depths upstream of the dam. The wicket gates will be manually raised and lowered from a workboat.

A typical raising operation to close the open channel gap would require the workboat anchoring on the closed side of the dam (wickets are in up position) and lifting the adjacent down wicket one at a time. The raising and lowering operation of a wicket can be accomplished by attaching the lifting device on the top or bottom of the down wicket. During the bottom lifting of a down wicket, there is a possibility that the bottom of the gate could slump on its bottom bumper block once the wicket is flipped into the up position. Any of such operational sequences anticipated during the course of operation of the wicket as well as unusual operations, such as sudden fall of a partially raised wicket, could induce critical loads on the mechanical components of the horse wicket. Simulation of various operational sequences in a scale model was thus regarded essential to determine the critical design loads on the mechanical components of the horse wickets. Experiments simulating the operating conditions of the Olmsted Dam were

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<sup>1</sup> Memorandum from the office of the U.S. Army Engineer District, Louisville (CELRL-ED-TH), 30 April 1999, Subject: Olmsted L&D 1:5 Model Testing.

<sup>2</sup> A conversion factors table is presented on p vi.

conducted at the 1:5-scale model facilities for facilitating the design development of the prototype horse wicket.

The 1:5-scale horse wicket was constructed and tested in the existing 1:5-scale hydraulic model facility for the anticipated flow and operational configurations. The horse wicket was geometrically scaled and fabricated in accordance to the design drawings previously furnished to ERDC. The 1:5-scale model facility, with 12 hydraulically operated wicket gates, was modified to simulate gate widths of 9 ft, 8 in. and gate heights to el 302<sup>1</sup> in the operating or raised position. The instrumented horse wicket replaced the previously used instrumented 1:5-scale hydraulic wicket in the model facility.<sup>2</sup> The experimental results for the horse wicket operations are presented in this document.

## Objectives

The objective of the 1:5-scale horse wicket experiments was to simulate the functional behavior of the horse wicket during its operation in the Olmsted Dam. The simulated experiments were conducted to determine loads during operations, to identify fabrication shortfalls, if any, to document operational difficulties, and to evaluate the horse wicket's overall operational performance.

## Horse Wicket Model Descriptions

The horse wicket experiments were conducted in the 1:5-scale model facility to evaluate the overall operability of the wicket. The model horse wicket was fabricated such that the material thickness, size, and the gate connections reproduced the proposed Olmsted Dam gate design. The hinges, horse, prop-rod, and hurter for this gate were constructed of material similar to the prototype.

The existing model spillway crest was modified to reproduce the present sill geometry, within feasible limits, for a width of one wicket gate and the experimental gate installed in this section. A stationary hoist platform with a winch installed was used to simulate raising and lowering operations of the wicket gate from the deck of a barge or workboat. The winch cable was equipped with a load cell and the forces in the cable were measured during the tests.

Loads in the winch cable, forces on the gate horse hinges and horse beams, forces on the prop-rod, and dynamic loads on the bumper block were measured with various operating scenarios. Operating scenarios included raising the gate with the winch cable attached to either end of the gate, lowering the gate, the gate in a stationary position, and tipping the gate into the operational position after hoisting the gate with the winch cable attached to the bottom of the gate.

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<sup>1</sup> All elevations presented in this report are in prototype units and are referenced to Ohio River Datum.

<sup>2</sup> Chowdhury, M. R., Hall, R. L., and Davis, W. G. (1998). "Flow-induced Structural Response of a 1:5-Scale Olmsted Wicket Model." Technical Report SL-98-2, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Figures 1 to 3 show the top-lifted operation of the wicket model in the dry 1:5 model facility. Typically during the installation process, the gate will be pulled with the winch cable attached to either end of the gate. On initiating the top-lifting lowering operation, the gate is pulled forward slightly until the prop-rod is disengaged from its parking position at 65 deg (Figure 1) and subsequently the winch cable is released to lower the gate. During the lowering of the wicket (Figure 2), the disengaged gate continues sliding downward as a result of its self-weight until the gate goes all the way down to its seated position, which is el 278. Bottom-lifting sequences for lowering the wicket from its up position are shown in Figures 4 to 9. As seen in Figures 4 and 5, bottom-lifting operation starts by raising the bottom end of the prop-supported gate and subsequently pivoting it in horizontal position over the top horse hinges. Once the prop is disengaged from its parking position (by slightly pulling the gate forward), the winch cable is released to lower the wicket to its down position as in Figure 9. This completes the lowering operation and a reverse of the process is used for raising the wicket from its lowered position.

The end of the raising cycle for a bottom-lifted down wicket, once the prop-rod is engaged and the winch cable is relieved (Figure 5), introduces a critical phase of gate operation by slamming the wicket end on the bumper block once the wicket is flipped into the up position. This flipping operation as well as the unusual operations such as a sudden fall of a partially raised wicket is also examined in the model experiments to determine the critical loads on the mechanical components of the horse wicket.

Major components of the horse wicket system are shown in Figure 6. These components include the wicket gate, horse, prop-rod, hurter, and bumper block. In its engaged position (Figure 1), the hydraulic forces exerted on the gate surface are transmitted to the sill through the prop-rod and the horse bottom hinges. Two top horse hinges provide the pivot point for the horse wicket. The bumper block is designed to sustain the gate bottom pounding during the engagement of the wicket in its up position for wet operation. The hurter and the bumper block are anchored in the sill as per Olmsted sill design. Assembled embedded frame supporting the bumper block, hinge castings, and bottom hinges of the horse are shown in Figures 10 to 11. Figures 12 show the fabricated hurter block. Figure 13 shows the downstream and upstream side of the bumper block. Hinge casting components are shown in Figure 14. Shop drawings showing the dimensions for different components of the model horse wicket gate are presented in Appendix A.

The overall operability of the wicket was observed and documented. For various pool elevations, the hinge and prop-rod forces on the instrumented wicket and winch cable forces were recorded.

## Scopes

The scope of work for the 1:5-scale horse wicket model included measurements of loads during operation, observation of the wicket and associated components' ease of fabrication, and overall operational performance. The scope of the work did not call for examining the flow-induced dynamic performance of the

horse wicket. However, a limited number of sensors capable of measuring the dynamics of the wicket were included. Three test series were examined to include the normal operating conditions of the horse wicket. For test series 1 and 2, the wickets to the left (looking downstream) of the horse wicket were required to be in the up position with a gap of at least two wickets to the right to simulate normal operating conditions for raising the wickets. For test series 3, all wickets were in the raised position, except for the horse wicket to simulate raising a stuck wicket after the remainder of the dam is up. This testing plan was based on the instructions from the U.S. Army Engineer District (USAED), Louisville, in a memorandum dated 7 July 1999, Subject: Horse Wicket Testing Plan. These operational configurations included:

### **Series 1: Top Lift Test**

With the wicket in the down position and the winch cable connected to the top of the wicket (downstream end), this experiment required raising the horse wicket and measuring the lifting load and cable angle for the winch cable and the loads in the hinges and prop. For a two-gate gap flow condition, top lifting gate operations at various positions of its raising cycle are shown in Figures 15 to 21. Figures 20 and 21 show the parking position of the operational horse wicket at which the prop-rod is engaged and the gate is at 65 deg. Figure 19 shows the initiation of disengagement operation for the prop-rod so that the gate can be lowered to its down position. The overall operability of the wicket were observed and documented. These experiments were conducted for the following conditions:

- a.* Headwater = 295, tailwater = 295
- b.* Headwater = 298, tailwater = 295
- c.* Headwater = 300, tailwater = 295
- d.* Headwater = 302, tailwater = 295
- e.* Headwater = 300, tailwater = 290
- f.* Headwater = 300, tailwater = 285

### **Series 2: Bottom Lift Test**

For a two-gate gap flow condition, sequential bottom lift wicket operations are shown in Figures 22 to 27. These figures show the wicket positions and the flow pattern at various phases of its lifting cycles. Figure 27 shows the parking position of the engaged wicket as it had been lifted to its operating position using the bottom-connected winch. Two operational configurations were considered for the bottom lift experiments. These are:

- a.* Normal lifting of wicket: During this operation, with the wicket in the down position and the winch cable connected to the bottom of the wicket (upstream end), the horse wicket was raised and the lifting load and cable angle for the winch cable and the loads in the hinges and prop were

recorded. The overall operability of the wicket were observed and documented.

- b. Drop test: With the wicket partially raised (prop in the up position in hurter), the bottom of the wicket was pushed down until the wicket flipped into the up position. The flipping and impact loads were measured. The overall operability of the wicket were observed and documented.

Both operations for bottom lift experiments were conducted for the following conditions:

- a. Headwater = 295, tailwater = 295
- b. Headwater = 298, tailwater = 295
- c. Headwater = 300, tailwater = 295

### **Series 3: Bottom Lift/Unusual Condition**

- a. Normal lifting of wicket: With the wicket in the down position and the winch cable connected to the bottom of the wicket (upstream end), this experiment required raising the wicket and measuring the lifting load and cable angle for the winch cable and the loads in the hinges and prop. The overall operability of the wicket was observed and documented. Pool elevations for which these experiments were conducted:

- (1) Headwater = 300, tailwater = 290
- (2) Headwater = 300, tailwater = 285

- b. Drop test: With the wicket partially raised (prop in the up position in hurter unless otherwise mentioned), the bottom of the wicket shall be pushed down until the wicket flips into the up position. For two separate head differentials as indicated below, the drop test was conducted with the wicket gate held at 70 deg with the prop-rod unlocked. The wicket was then released and allowed to fall freely while data were recorded (gate drops to down position at el 278). The flipping and impact loads shall be measured. The overall operability of the wicket will be observed and documented. This experiment was conducted for the following conditions:

- (1) Headwater = 298, tailwater = 295
- (2) Headwater = 300, tailwater = 295
- (3) Headwater = 300, tailwater = 293 (unlocked prop)
- (4) Headwater = 302, tailwater = 295 (unlocked prop)



## 2 Instrumentation, Data Acquisition, and Analysis

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### Instrumentation

A total of 40 data channels recorded dynamic data for the 1:5-scale horse wicket model. Figure 28 shows a general layout of sensors on the horse wicket systems. Detailed transducer locations on the wicket gate model are shown in Figure 29. In this figure, the strain gage locations are marked by a letter "S" followed by a number, and similarly the accelerometers locations are designated by "A" followed by a number. The scope of the work required measurement of loads during the operation of the wicket model. It is to be noted that the scope of work of this investigation did not call for examining the flow-induced dynamic performance of the horse wicket. However, a limited number of strain gages and accelerometers were installed on the wicket to capture its general response levels for the proposed dam operating conditions. The transducers used for measuring the wicket responses included:

- a. Eight strain gages (Figure 29 shows locations of gages S4a through S7b) were installed on the top skin plate (Suffix a) and down side of the main I-beams (Suffix b) - near the pivotal connection of the gate to the horse.
- b. One tilt meter on the gate to measure the gate angle (gage T2 in Figure 29).
- c. One prop-rod load pin to measure the axial load (gage designation, P1).
- d. Six accelerometers on the skin plate (gages A1 to A6 in Figure 29). Accelerometers were mounted in three rows (top, middle, and bottom of the gate) by two columns (two long edges).

The locations of the transducers on the horse are shown in Figures 30 and 31. Figure 31 shows the instrumented pin connection to the horse hinges and the locations for strain and accelerometer sensors. Sensors used to measure the horse responses included:

- a. Four double-axes load pins measuring orthogonal components of reactions at each hinge connection (eight channels of data, gages P3X through P6Y, where the direction of X is normal to horse long axis and Y is parallel to it).

- b. Three strain gages (one on the middle of each vertical bar and another in the cross-bracing) (gages S1 to S3 in Figure 31).
- c. One tilt meter to measure the horse angle (Gage T1 in Figure 31).
- d. One triaxial accelerometer (three channels of data) (gage A7).

The winch cable sensors consisted of:

- a. One cable load transducer to measure winch cable force (gage CL).
- b. One tilt meter to measure the cable angle (gage T3).

A modification of the bumper block connection to its base was needed to measure the bumper block stresses as a result of the pounding of the bottom of the gate onto the bumper block during drop test experiment. Figure 32 shows the modified design of the bumper block. In this figure, the locations for strain sensors measuring the shear and bending strains at the sensitive sections are shown. Closeup downstream and upstream views on the bumper block when installed on the sill are shown in the views shown in Figure 33. These figures also show the bottom hinge pins that connect the horse bottom to the hinge castings. As seen in Figure 33, the load applied on the bumper surface is transmitted through the instrumented sections. The bumper plate transducers included:

- a. Two shear strain transducers (gages B1 and B4 in Figure 32).
- b. Three moment strain transducers (gages B2, B3, and B5 in Figure 32).

Other transducers were:

- a. Pressure transducer for measuring upstream pool elevations
- b. Pressure transducer for measuring downstream pool elevation.

## Data Acquisition and Analysis

### System and operation

The data acquisition system for the Olmsted 1:5 Model Study consisted of one PC for data storage, data processing, and process control, an analog-to-digital converter (ADC), signal conditioning amplifiers, and a printer. Signal conditioning included continuous variable gain amplifiers, tracking filters, and antialias filters. The signal conditioning amplifiers were manufactured by Vishay and could supply gains up to 10,000. Custom made programs were installed in the PC to regulate data acquisition and control gate position. The PC used to record data also contained a National Instruments AT-MIO-16F-5 ADC board and a Real Time Devices digital input/output (DIO) board. The DIO were used to activate the desired hydraulic system function for the experiment to be run. The ADC had a 12-bit resolution and was configured for -5 to +5 volt input range. The ADC was a printed circuit board that plugged into a PC expansion slot.

Custom software was written to take calibration measurements, record data during an experiment, and make time-history plots of the data recorded.

MATLAB matrix analysis software was used for much of the data analysis; it contains many powerful numerical and graphical tools to manipulate matrices, perform frequency analyses, plot graphs as well as perform other crucial mathematical functions.<sup>1</sup>

## Calibration and data acquisition

A typical experiment required balancing and initialization of data channels with wicket gate resting at 0 deg for no-flow condition (upstream and downstream pool elevation at 300). Each experiment presented in this report was preceded with such a balancing experiment that zeroed all transducers output at no-flow condition. This balancing experiment thus provides the baseline measurements for all data channels used subsequently for recording responses for operating conditions presented herein. Each sensor was calibrated in the laboratory, and a typical calibration test setup for one of the load pins used for the horse hinges is shown in Figure 34. Figure 35 shows the load pins mounted on the horse and prop-rod attachments. Calibration factors for each data channel relating voltage output to corresponding engineering unit are listed in Table 1. In Table 1, also shown is the sensor designation list associating each sensor with a corresponding channel number used for data recording. Locations for each sensor on the gate and the type of responses each recording are also listed in this table. Figures 29 to 32 show the location of gages as well. Last column in the table shows the sign convention for positive signal associated with each physical data.

A typical information file summarizing the statistics of the random data recorded during an experiment is presented in Table 2. During a typical experiment, the pool elevations were maintained at the desired level by means of an automated sideweir and tailgate, respectively. As seen in the upstream and downstream pool record (Channel 33 and 34), the recorded pool levels were not absolutely steady as desired. This indicates a slight possibility of violation of the requirement for a stationary and ergodic process that is most desirable for recording random data acquired during the experiment. However, for all practical purposes, the data recorded could be regarded as stationary and ergodic as it is assumed herein. As seen in this table, the minimum, maximum, and the root mean square of the recorded data were available for assessment right at the end of each experiment. This summary sheet provided an instant crosscheck to the recorded data for their onsite verification so that malfunction of any channel could be detected and correct data acquisition could be ascertained. The summary table also provides a one-standard deviation from the mean for each recorded channel.

## Data Analysis/Time Domain

The measured input was originally an analog signal. The front end converted the analog signal to a series of digital values. The digitized input signal, as a set of  $N$  discrete values evenly spaced in the period  $T$ , is recorded to display the time signal for each channel. Each channel is sampled at 500 samples per second per

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<sup>1</sup> MathWorks, The. (1992). *MATLAB for windows user's guide*. Natick, MA.

Table 1 OLMSTED 1:5 –Scale Horse Wicket Sensor Calibration List									
Sensor Designation List	Data Channel Number	Serial Number	Gage Excitation Level, V	Amplification Factor, Gain	08/01/2000 Calibration Step	All Locations Referenced to Looking Downstream			
						Calibration Value	Location On The Gate	Notes	
P3X	1	Q14797-3	10.00	1,000	.993 mv/v	4.965v=800 lbf	Bottom Right Load Pin	Horse Force U/S = + signal	
P3Y	2	Q14797-3	10.00	1,000	.976 mv/v	4.88v=800 lbf	Bottom Right Load Pin	Gate Force to Crest = +	
P4X	3	Q14797-4	10.00	940	-1.048 mv/v	-4.926v=800 lbf	Bottom Left Load Pin	Horse Force U/S = + signal	
P4Y	4	Q14797-4	10.00	940	1.057 mv/v	4.968v=800 lbf	Bottom Left Load Pin	Gate Force to Crest = +	
P5X	5	Q14797-5	10.00	1,000	-.888 mv/v	-4.44v=800 lbf	Top Right Load Pin	Horse Force U/S = + signal	
P5Y	6	Q14797-5	10.00	1,000	-.739 mv/v	3.695v=800 lbf	Top Right Load Pin	Gate Force to Crest = +	
P6X	7	Q14797-6	10.00	1,000	.923 mv/v	4.615v=800 lbf	Top Left Load Pin	Horse Force U/S = + signal	
P6Y	8	Q14797-6	10.00	1,000	-.952 mv/v	4.76v=800 lbf	Top Left Load Pin	Gate Force to Crest = +	
P1	9	Q14797-1	10.00	500	180K	916.2 lbf	Prop-rod Load Pin	Prop Force Tension = + signal	
S1	10	S1	5.00	4,000	1 Meg	1451.6 lbf	Horse Right Side Strain	Strain calibrated in Load	
S2	11	S2	5.00	4,000	1 Meg	1451.6 lbf	Horse Left Side Strain	Strain calibrated in Load	
S3	12	S3	5.00	4,000	1 Meg	67.2 μ-in. /in.	Horse Cross Strain	Actual Strain in μ in. / in.	
S4A	13	S4A	5.00	4,000	1 Meg	67.2 μ-in. /in.	Lower Right D/S Strain	Actual Strain in μ in. / in.	
S4B	14	S4B	5.00	4,000	1 Meg	67.2 μ-in. /in.	Lower Right U/S Strain	Actual Strain in μ in. / in.	
S5A	15	S5A	5.00	4,000	1 Meg	67.2 μ-in. /in.	Lower Left D/S Strain	Actual Strain in μ in. / in.	
S5B	16	S5B	5.00	4,000	1 Meg	67.2 μ-in. /in.	Lower Left U/S Strain	Actual Strain in μ in. / in.	
S6A	17	S6A	5.00	4,000	1 Meg	67.2 μ-in. /in.	Upper Right D/S Strain	Actual Strain in μ in. / in.	
S6B	18	S6B	5.00	4,000	1 Meg	67.2 μ-in. /in.	Upper Right U/S Strain	Actual Strain in μ in. / in.	
S7A	19	S7A	5.00	4,000	1 Meg	67.2 μ-in. /in.	Upper Left D/S Strain	Actual Strain in μ in. / in.	
S7B	20	S7B	5.00	4,000	1 Meg	67.2 μ-in. /in.	Upper Left U/S Strain	Actual Strain in μ in. / in.	
CL	21	WES3	5.00	1,000	320K	883.5 lbf	Winch Cable Load		
A1	22	7256		10	105.7 mv/g	1.0 g	Top Right Accelerometer	1.057 V/g.peak @ 10 gain	
A2	23	7257		10	103.0 mv/g	1.0 g	Top Left Accelerometer	1.030 V/g.peak @ 10 gain	
A3	24	7258		10	104.3 mv/g	1.0 g	Center R. Accelerometer	1.043 V/g.peak @ 10 gain	
(Continued)									

Table 1 (Concluded)									
Sensor Designation List	Data Channel Number	Serial Number	Gage Excitation Level, V	Amplification Factor, Gain	08/01/2000		All Locations Referenced to Looking Downstream		
					Calibration Step	Calibration Value	Location On The Gate	Notes	
A4	25	7259		10	104.8 mv/g	1.0 g	Center Left Accelerometer	1.048 V/g.peak @ 10 gain	
A5	26	7260		10	97.3 mv/g	1.0 g	Bottom R. Accelerometer	.973 V/g.peak @ 10 gain	
A6	27	7262		10	103.6 mv/g	1.0 g	Bottom Left Accelerometer	1.036 V/g.peak @ 10 gain	
A7X	28	628X		15	104.5 mv/g	1.0 g	Horse X Accelerometer	1.5675 V/g.peak @ 15 gain	
A7Y	29	628Y		15	106.4 mv/g	1.0 g	Horse Y Accelerometer	1.596 V/g.peak @ 30 gain	
A7Z	30	628Z		15	102.2 mv/g	1.0 g	Horse Z Accelerometer	1.533 V/g.peak @ 30 gain	
T1	31	1457			101.9 mv/deg	1.0 deg + 28.3	Horse Tilt Meter	-1.443v = 0 deg 1.795v = 65 deg	
T2	32	1456			99.34 mv/deg	1.0 deg + 45	Gate Tilt Meter	-.795v = 0 deg 2.430v = 65 deg	
U/S POOL	33						U/S Model Pool	1.008v = 280.4 ft 5.000v = 305.2 ft	
D/S POOL	34						D/S Model Pool	2.119v = 282.8 ft 4.602v = 302.8 ft	
B4	35	4	5.00	3550	640k	2271 lbf	Bumper Plate Right Shear		
B1	36	1	5.00	2860	640k	1801.8 lbf	Bumper Plate Left Shear		
B3	37	3	5.00	1830	640k	1188.1 lbf	Bumper Plate R. Moment		
B2	38	2	5.00	1780	640k	1128.6 lbf	Bumper Plate L. Moment		
B5	39	5	5.00	1780	320k	1470.0 lbf	Bumper Plate Center Moment		
Laser velocity	39	Used only for laser tests, no strain gage data collected during this test				Top Gate Velocity		.452v = .5 in./sec vel Left @ 10 hz	
T3	48	1424			99.0 mv/deg	1.0 deg	Winch Cable Tilt Meter	-1.72V = -17.374 deg 4.455V = 45 deg	
Laser disp.	49					1.0v=1.58 mm	Top Gate Displacement	1.0v. = 1.00 mm disp	

**Table 2**  
**A Typical Test Summary Sheet for the Olmsted 1:5-Scale Horse Wicket Model**

<b>Information File Name:</b>		wicketds38a.inf					
<b>Sample Rate:</b>		500.000 samples/sec/channel					
<b>Length of Time Recorded:</b>		00:00:45.00					
<b>Data Collected:</b>		3/2/01 at 10:43:56 AM					
<b>Remarks:</b>		Balance and calibrated with wicket gate resting at 0-deg Winch cable, hooked to top of gate( d/s end )					
<b>Data Filtering:</b>		Channels 1-33 and 40-47 filtered at 200 Hz. Low Pass					
<b>Gate Position:</b>		Gate #6 at down position & winch cable attached to top of gage. Gates 7 down during test.					
<b>Pool Elevations:</b>		300-ft headwater & 285-ft tailwater					
<b>Test Condition:</b>		Wet rotation of horse wicket from 0 to 65 deg					
Channel Number	Gage Type	Minimum Reading	Average Reading	Maximum Reading	Standard Deviation	Root Mean Square	Units
<b>Test Statistics</b>							
1	Bottom Hinge (P3X)	-28.323	-2.941	34.224	12.857	13.189	lbf
2	Bottom Hinge (P3Y)	-161.693	-78.319	69.24	36.397	86.363	lbf
3	Bottom Hinge (P4X)	-65.818	43.333	175.25	51.206	67.081	lbf
4	Bottom Hinge (P4Y)	-160.795	108.491	432.848	136.898	174.674	lbf
5	Top Hinge (P5X)	-25.954	11.613	41.35	11.881	16.614	lbf
6	Top Hinge (P5Y)	-132.675	64.312	287.551	118.847	135.132	lbf
7	Top Hinge (P6X)	-77.448	-24.06	22.853	20.323	31.494	lbf
8	Top Hinge (P6Y)	-103.401	11.147	208.443	74.554	75.383	lbf
9	Prop Pin	-788.289	-14.04	69.501	177.334	177.889	lbf
10	S1	-196.181	-15.636	116.253	64.827	66.686	lbf
11	S2	-258.735	-43.215	121.134	82.395	93.041	lbf
12	S3	-17.916	-3.637	8.983	5.632	6.704	μ- in./in.
13	S4A	8.054	98.598	113.863	30.67	103.258	μ- in./in.
14	S4B	-40.326	-28.717	4.762	10.469	30.566	μ- in./in.
15	S5A	23.748	88.915	114.002	20.419	91.229	μ- in./in.
16	S5B	-27.573	-19.982	4.347	6.664	21.064	μ- in./in.
17	S6A	-17.222	77.32	103.029	27.92	82.207	μ- in./in.
18	S6B	-31.864	-21.737	9.824	9.587	23.757	μ- in./in.
19	S7A	-12.048	79.333	105.14	28.662	84.352	μ- in./in.
20	S7B	-29.179	-20.65	4.584	7.491	21.967	μ- in./in.
21	Winch Cable Pin	-23.619	657.836	1052.726	272.231	711.94	lbf
22	A1	-0.85	-0.044	0.423	0.059	0.074	g
23	A2	-0.445	-0.05	0.371	0.055	0.074	g
26	A5	-0.334	-0.045	0.353	0.05	0.067	g
27	A6	-0.841	-0.042	0.261	0.058	0.072	g
31	Horse-Angle	-0.604	32.255	67.018	20.946	38.459	deg
32	Gate Angle	-0.631	32.196	66.369	20.997	38.437	deg
33	Upstream pool	299.689	300.449	301.319	0.353	300.449	ft
34	Downstream pool	283.933	285.16	286.11	0.47	285.16	ft
48	Winch cable angle	-39.994	-27.011	-17.158	6.005	27.67	deg

channel for about 45 sec (model dimension). A low-pass filter of 200 Hz was used for each recorded output response.

The real-time scope displays a number of input channels in a variety of formats. MATLAB<sup>1</sup> was used to generate the time-domain data presented in this report. All packages allow mathematical operations of the recorded channel such that the units of measurement could be converted, the analytical operations could be performed, and data could be displayed in model or prototype units. As mentioned earlier, a custom program was used during the experiment to check the consistency and quality of the recorded data by observing each recorded channel on site. Time-domain signals could be displayed as a function of time or as a function of gate insertion depth.

For a meaningful representation of the acquired data, reaction forces exerted on gate components are converted as a function of gate angle. The positive gate angle is measured counterclockwise from the long axis of the flume; gate is going up from the down position. The gate angle is 0 deg at its seated position and 65 deg for the fully engaged wicket parked on the prop-rod. Similarly, the positive horse and winch cable angles are measured counterclockwise from the horizontal axis along the stream direction. Positive directions of the tilt meters measuring the angular directions of the horse gate system are shown in Figure 36.

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<sup>1</sup> Ibid.

## 3 Results and Discussions

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### Introduction

The experimental results for various wicket operations anticipated during the normal course of operation of Olmsted Dam are presented in this section. These operations included top-lifted, bottom-lifted, and unusual raising and lowering of wickets as described in the introductory chapter of this report. For each test, actual forces exerted on the horse wicket and the lifting force required for operating the wicket in the gap were recorded. The maximum amplitude of these responses for each test configurations is tabulated and the force history as a function of horse angle is presented. All numbers mentioned in this document are in model units with the exception of elevations, which are in prototype units. For conversion to prototype estimation, the magnitude of model parameter must be converted using the scaling factors listed in Table 3.

<b>Table 3</b> <b>Relations for Converting Model Data to Prototype Equivalents</b>		
<b>Multiply Model Dimension</b>	<b>By</b>	<b>To Obtain Prototype Equivalent</b>
Length	5	Length
Time	2.236	Time
Force	125	Force
Strain	1	Strain
Acceleration	1	Acceleration

Designation of channel numbers corresponding to each gage is shown in the following tabulation.



Channel Numbers	Sensor Type and Location
1 – 4	Horse hinge reactions, bottom pins, x and y directions
5- 8	Horse hinge reactions, top pins, x and y directions
9	Prop pin
10	Horse right bar force
11	Horse left bar force
12	Horse cross-bar strain
13-16	Gate strains, down of prop support
17-20	Gate strains, above the prop support
21	Winch cable load
22	Top right gate acceleration
23	Top left gate acceleration
24	Center right gate acceleration
25	Center left gate acceleration
26	Bottom right acceleration
27	Bottom left gate acceleration
28-30	Horse tri-axial acceleration
31	Horse tilt meter
32	Gate tilt meter
33	Upstream pool elevation
34	Downstream pool elevation
35	Bumper plate left shear
36	Bumper plate right shear
37	Bumper plate left shear (based on moment gage)
38	Bumper plate right shear (based on moment gage)
48	Winch cable tilt meter

## General Observations

These experiments were conducted to determine the overall operability of the horse wicket. The gate was lowered slowly by the winch with the winch cable attached to the top of the test gate. Figures 18 and 19 show the beginning of the wicket lowering operation. As seen in the figure, the wicket is slowly lowered into the gap as the winch cable is released and the loads are recorded. The gate is lowered from the top and continued to go down until the gate is fully seated at el 278 (Figure 3). All elevations presented here are in prototype units. In general, normal operating conditions of the Olmsted Dam showed no operability problems during the top lifting and bottom lifting operations of the wicket. However, only during the unusual bottom lifting operation of the wicket over 10-ft head differentials, there were difficulties in locking the prop-rod on the hurter. Also during these unusual tests, the gate vibration was observed (flipped up and down with the water flowing over and around it) when the gate was locked on hurter with partially raised upstream gate end. Accelerometer data from the gate indicate the existence of such a vibratory motion of the gate during this transient phase of operation. Considering the rare event operation of the dam for this unusual case, no further analysis of the accelerometer data was conducted to determine the cause and effect of this vibratory motion on gate performance over time. Unless the unusual operation becomes a normal event for dam operation, a thorough dynamic analysis of the gate performance resulting from such a flow-induced

vibration observed during 10- and 15-ft head differential model experiments must be examined. Results for the wicket experiments are discussed in the following text.

## Horse Wicket Experiment Results

General observation of the operability of the horse wicket for various operating configurations and different pool conditions are summarized in Table 4. This table presents the head differentials between the upstream and downstream pool levels and the gate opening (excluding the horse wicket) for which the experiments were conducted. The pool levels and head differentials listed in the table are in prototype units. As indicated in this table, the first series of tests were top-lifted experiments for which the winch cable was connected to the top of the wicket. This, in fact, would be the downstream end with the gate in the down or lowered position. For six different pool differentials (0, 3, 5, 7, 10, and 15 ft) with a variety of gate opening configurations (1 gate gap, 2 gate gap, and 3 gate gap), no operability problem was evident.

Series 2 experiments comprised of two sets of operations in which the winch cable was hooked to the upstream end bottom of the horse wicket. As indicated in Table 4, these experiments were conducted for three different head differentials (0, 3, and 5 ft) for a two-gate gap flow configuration. In the first set of operation (Series 2A), these data were recorded while the gate had been raised from down to up position. The second set of bottom lifted operations (Series 2B) was conducted on a prop-supported horse wicket for which the bottom of the wicket was pushed down to flip the wicket into its up position. Data were gathered during the closing of the gap while the upstream end of the wicket was pushed down from its raised position. A 1- by 4-in. board was used by technicians to push down the upstream end of the wicket under the water flow, since the floating gate was unable to go down by itself at the onset of the experiment. As soon as the wicket end started its downward course, the cable was released from the upstream end and the gate was allowed to follow the course of water flow. As indicated in the table, both experiments for Series 2 dam operations showed no operating problems in raising and closing the gap, respectively. However, as will be presented later, the vibratory motion of the pivoted gate at the onset of the drop test, before being pushed below the water, was high. This high vibratory motion resulted during impact resulting from dropping of prop-rod on the hurter slot as the wicket was raised from down to up position. Also, high amplitude motion was evident during the flipping of the upstream end of the wicket at its contact to the bumper block.

The third series of experiments were a repetition of the setup for the already-mentioned experiments with unusual pool elevations (10- and 15-ft head differentials) as indicated in Table 4. Unlike these experiments, the unusually high head-differentials experiments showed somewhat a random operability problem during the bottom-lifted gate operation. As mentioned in the table, Series 3A experiments indicated a possibility that the prop-rod might not lock properly on the hurter at the end of its journey from down to up position while being bottom lifted as in experiments, wicketus15a-c. This uncertain operability problem, however, could not be repeated on tests wicketus42a-c that were conducted on

<b>Table 4</b> <b>General Information of 1:5-Scale Horse Wicket Experiments (Gates are numbered sequentially from left to right starting with 1, looking downstream. Horse gate is number 6 in the flume.)</b>				
Test Number	Head Differential, ft	Open Gates	Upstream Pool, ft	Remarks
<b>Series 1: Top-Lift Test</b> <b>Horse and gate rotated from 0 to 65 deg</b>				
Wicketds1a-c	0	1, 12	295	No flow test. Raise horse gate 6. Calibration test.
Wicketds19a-c	0	7,8	295	No flow test.
Wicketds4a-c	3	7&8	298	Raise test gate 6.
Wicketds5a,d	3	7&8	298	Raise test gate 6.
Wicketds2a-c	3	test gate	298	Raise test gate 6.
Wicketds31a-b	5	7 & 8	300	Raise gate. Ch48 has bad cal.
Wicketds5b-c	5	7&8	300	Raise test gate 6.
Wicketds6a-d	5	7&8	300	Raise test gate 6.
Wicketds3a-c	5	test gate	300	Raise test gate 6.
Wicketds33a-b	7	7 & 8	302	Raise test gate 6.
Wicketds39a-c	10	7 & 8	300	Raise test gate 6.
Wicketds38a-c	15	7	300	Raise gate 6.(ch13 bad cal)
Wicketds38d-f	15	7 & 8	300	Raise gate 6.
<b>Series 2A: Bottom-Lift Test (Wicket in the down position)</b> <b>Horse rotated from 0 to 65 deg. Gate was raised above the reference axis (stream direction) from 0 to -35 deg</b>				
Wicketds7a-b	0	1,2,3,7,8,12	0	Winch cable was connected to bottom of gate. Dry test. Raise gate 6.
Wicketds8a-c	0	1,2,3,7,8,12	295	No flow. Raise gate 6. Channel 25 (A4) is bad.
Wicketds9a-c	3	7&8	298	Raise gate 6. Channel 25 (A4) is bad.
Wicketds10a-c	5	7,8	300	Raise gate 6. Channels 24 & 25 (A3 & A4) are bad.
<b>Series 2B: Bottom-Lift Drop Test (Prop supported partially raised wicket, downstream end of the gate was pushed with a 1x4)</b> <b>Horse parked at 65 deg and the gate rotated from ~-15 to 65 deg</b>				
Wicketds12a-c	0	7,8	295	Push down gate 6. Channels 24 & 25 are bad.
Wicketds11a-c	3	7,8	298	Push down gate 6. Channels 24 & 25 are bad.
Wicketds13a-c	5	7,8	300	Push down gate 6. Channels 24 & 25 are bad.
<b>Series 3A: Bottom-Lift Unusual condition (Wicket in the down position)</b> <b>Horse rotated from 0 to 65 deg. Gate was raised above the reference axis (stream direction) 0 to -35 deg</b>				
Wicketus40a	0	1,7 & 8	300	No flow test. Raise gate 6.
Wicketus14a-c	10	Test gate	300	Installed instrumented bumper block. Channels 24 & 25 are bad. Problem in parking the prop-rod on the hurter. Spikes in the data when prop-rod was positioned on the hurter.
Wicketus41a-c	10	Test gate	300	Raise gate 6. No problem in locking prop as in Tests 14a-c.
Wicketus15a-c	15	Test gate	300	Channels 24 & 25 are bad. Prop-rod would not seat on the hurter.
Wicketus42a-c	15	Test gate	300	Raise gate 6. No problem in locking prop as in Tests 15a-c.
(Continued)				

Table 4 (Concluded)				
Test Number	Head Differential, ft	Open Gates	Upstream Pool, ft	Remarks
Series 3B: Bottom-Lift Drop Test - Unusual Condition (Prop-supported, partially raised wicket, downstream end of the gate was pushed with a 1 x 4) Horse parked at 65 deg and the gate rotated from ~38 to 65 deg				
Wicketus28a-c	3	Test gate	298	Drop gate to bumper plate. Clipped top two accelerometers and Bumper plate sensors
Wicketus28b	3	Test gate	298	Clipped strain gages
Wicketus28c	3	Test gate	298	Clipped Channels 4,9,10,22,23,26,and 27.
Wicketus28d	3	Test gate	298	Clipped bottom two accelerometers
Wicketus28e	3	Test gate	298	Channels 8 and 47 bad
Wicketus28f	3	Test gate	298	Channels 8 and 47 bad and channel 27 clipped
Wicketus29a	5	Test gate	300	Clipped bottom left accelerometers (57g > 50g calibration)
		Note: Permanent damage to the bumper. Bumper plate was over-ranged & at the end of experiment it had a 640-lbf offset.		
Series 3B: Bottom-Lift Flipping Test – Unlocked Prop (Downstream end of the gate was pushed with a 1 x 4) Unlocked Horse at 70 deg and the gate dropped				
Wicketds36a	0	1,7 & 8	300	No flow test, rotate gate 6.
Wicketds34a-b	7	7,8 & 9	300	Gate droppped from a raised unlocked position.
Wicketds34c	7	7,8 & 9	300	Gate droppped from a raised unlocked position. Channel 8 (P6Y) had a bad cable connection.
Wicketds35a-e	7	7,8 & 9	302	Gate droppped from a raised unlocked position. Channel 8 (P6Y) had a bad cable connection.
Wicketds35d-e	7	7,8 & 9	302	Gate droppped from a raised unlocked position.
Series 4: Fixed Gate Test				
Wicketds20a-c	3	7	298	Laser was pointed on the right side of gate looking upstream.
Wicketds21a-c	3	7	298	Laser test, left side of gate. Laser on d/s side of gate.
Wicketds18a-c	3	7,8	298	Laser was pointed on the right side of gate looking upstream. Channels 24 & 25 are bad.
Wicketds22a-c	5	7	300	Laser test, right side of gate. Laser on d/s side of gate.
Wicketds23a-c	5	7	300	Laser test, left side of gate. Laser on d/s side of gate.
Wicketds24a-c	10	7	300	Laser test, right side of gate. Laser on d/s side of gate.
Wicketds25a-c	10	7	300	Laser test, left side of gate. Laser on d/s side of gate.
Wicketds26a-c	15	7	300	Laser test, right side of gate. Laser on d/s side of gate.
Wicketds27a-c	15	7	300	Laser test, left side of gate. Laser on d/s side of gate.

different days for the similar test configuration as in experiment wicketus15a-c. A minor operability problem encountered in experiments 14a-c could be tackled with a little maneuvering of the wicket prior to engaging the prop-rod on the hurter. To seat the prop-rod during such a situation, it was required to partially

raise the prop-rod again and usually on the second attempt, the prop-rod would seat on the hurter. The same experiments, when repeated afterwards (wicketus41a-c), however, could not reproduce the prop-rod parking problem of experiments wicketus14a-c, where difficulty was experienced in locking the prop on the hurter. As in the other bottom lifted wicket operation, the wicket in the locked position with its upstream end slightly up out of the water, the wicket moved up and down with the water flowing over and around it. This vibratory motion is also evident in the accelerometer history recorded for the accelerometers mounted on the wickets. Frequency response analysis of the accelerometer data indicated that the vibratory motion resulted during an impact because of the prop-rod positioning on the hurter slot.

It is to be noted that each test number presented in the table has been suffixed with small alphabets such as a to c. Thus, the test designation wicketds15a-c includes three tests (wicketds15a, wicketds15b, and wicketds15c) repeated for the same flow and operating conditions. Drop test for the prop supported partially raised wicket (Series 3b) for high pool differentials induced very high accelerations and strains on the horse gate systems. As indicated in the table, the strain gages were clipped and the accelerations recorded on the gate surface exceeded 50-g calibration magnitude of the sensors. Extreme loads resulting from the unusual operation of the model at 5-ft head difference caused damage to the sensors used for the horse wicket. One horse pin was lost and a few others were damaged. Also the prop-rod pin was damaged and needed replacement. Because of the concern for the serviceability of the horse gate model and its sensors, all requested tests for 10- and 15-ft head differences because of unusual conditions were postponed. Posttest observation of the instrumented bumper block indicated inelastic deformation as a result of the severe impact loading during the Series 3b bottom-lift drop experiments.

For a specific positioning of the wicket, tests similar to the bottom-lifted drop test (Series 3b) were conducted for the unlocked gate. These experiments simulated the accidental falling of the wicket from its parked position. This experiment started with the horse gate at a 65-deg locked position. It was then raised to unlock the hurter engagement, the winch cable was released, and the gate was allowed to settle into the 0-deg position. Like the unusual drop test in Series 3b, this test induced unusually high accelerations on the horse wicket.

Differential movements of the top two corners of the horse wicket for a limited number of flow configurations were recorded using a portable laser Doppler vibrometer system. These experiments were conducted to examine the rotational imbalance between the top corners of the gate during dam operations. These data were useful in determining the tolerance limits for the bracing beam used for blank insertion.<sup>1</sup> Series 4 presents the test setup for which these experiments were conducted for the Olmsted horse wicket model.

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<sup>1</sup> Chowdhury, M. R., and Davis, W. G. (2000). "Olmsted Wicket Blank Experiment in 1:5-Scale Hydraulic Flume Model, ERDC TR-00-7, U.S. Army Engineer Research and Development Center, Vicksburg, MS.

## Data Analyses and Discussions

Hinge forces parallel and normal to long direction of the horse, and the prop-rod forces indicate the variation of transmitted forces on the horse wicket as the gate is raised or lowered into the gap. Left and right directions correspond to the model orientation looking from upstream toward downstream. Maximum amplitude of responses for selected experiments is tabulated in Table 5. Forces include hinge reaction forces, prop force, and the winch cable lifting force recorded during the scheduled operations. Resultant forces and their associated angle from the y-direction (along the long direction of the horse, positive, counter-clockwise) are tabulated and the corresponding horse angle at which this maximum forces occurred is also listed in this table. This table outlines the maximum resultant pin force vectors resulting from dam operations investigated in the 1:5-scale horse wicket model. These maximum response amplitudes are obtained from the channel data recorded during the model experiments. Summaries of test statistics for all model experiments are provided in Appendix B.

As seen in Table 5, averaged responses for the respective test configurations for which the experiments were repeated for identical operation are computed. For instance, the top lifting gate operation in a 15-head differentials with two-gate gap (case WicketDS38d-f) will induce an average maximum reactions of 209.2 and 546.1 lbf for the right and left bottom hinges, respectively. As indicated in the table, these maximum resultant bottom hinge forces occurred at about 5 to 6 deg up from the sealed position (el 278). And the corresponding prop and winch cable forces for this model operation were 787.5 and 982.3 lbf, respectively.

The results indicate that the maximum forces, for each test configuration, are directly proportional to the corresponding head differentials, and thus the responses for one of each series with highest head differentials are presented below. Detailed data plots for selected tests are presented in the Appendix C.

Selected sensor data one for each series of experiments presented in Table 4 are presented in Figures 37 through 135. Note that the results presented in these figures correspond to the test numbers shown in Table 4. As discussed previously, these figures are generated as a function of horse angle when appropriate. Time-domain sensor responses and the horse angle records are correlated to determine the responses (presented in these figures) as a function of horse angle. Note that the positive horse angle is measured counterclockwise from the axis parallel to the stream direction.

For experiments requiring lifting of the horse wicket from down to up position (Series 1, Series 2A, and Series 3A), all reaction forces are presented as a function of horse angle. Figures 37 to 42 show the variations of hinge pin forces, prop-rod reaction, and the winch cable lifting force as a function of horse angle as the wicket was raised from down to up position for the top lifted operation of the horse wicket in a 15 ft head differentials, two-gate gap flow condition. These plots indicate the horse angle at which the maximum response occurred for each pin, respectively, along its sensitive axis. For example, the prop-rod pin experienced

**Table 5**  
**Horse Hinge Force Vectors**

File Name	Upstream Pool ft	Downstream Pool ft	Bottom Hinge						Top Hinge						Prop Force		Winch Cable Force	
			Right			Left			Right			Left			Prop Rod Force lbf	Corresp. Horse Angle deg	Max Lifting Force lbf	Corresp. Horse Angle deg
			Force lbf	Phase Angle deg	Horse Angle deg	Force lbf	Phase Angle deg	Horse Angle deg	Force lbf	Phase Angle deg	Horse Angle deg	Force lbf	Phase Angle deg	Horse Angle deg				
Series 1: Top-Lift Test (Horse and gate rotate from 0 to 65 deg)																		
WicketDS1A	295	295	70.2	76.8	65.2	82.7	85.9	65.6	69.8	84.4	65.2	80.5	-76.3	65.6	86.9	65.2	179.7	0.2
WicketDS1B	295	295	62.8	76.3	65.4	77	86.7	65.5	72.7	89.3	65.4	83.3	-76.4	65.5	70.5	65.1	180.8	0.1
WicketDS1C	295	295	74.2	78.8	65.3	77.4	85.9	65.5	80.1	85.5	65.3	82.5	-76.7	65.5	89.4	65.2	189.7	0.1
Averages for 0 head			69.1	77.3	65.3	79.0	86.2	65.5	74.2	86.4	65.3	82.1	-76.5	65.5	82.3	65.2	183.4	0.1
Series 2A: Bottom-Lift Test (Prop supported partially raised wicket, downstream end of the gate was pushed with a 1 x 4)																		
(Horse was rotated from 0 to 65 deg. Gate was raised above water level from 0 to -35 deg)																		
WicketDS4A	298	295	146.5	70.9	66.3	125.3	76.3	65.4	166.8	85.3	65.3	43.7	-20.1	65.3	-339.1	65.6	263.9	45.8
WicketDS4B	298	295	180	76.3	65.3	103.8	77.4	66.4	185.8	88.3	65.3	34.2	-18.4	65.3	-543.5	66.1	272.8	45.2
WicketDS4C	298	295	128.7	71.7	65.3	127.3	81.7	65.3	169.4	-87.2	65.3	31.5	-22	65.3	-430.4	65.7	259.5	0.2
Averages for 3-ft head, 2 GG			151.7	73.0	65.6	118.8	78.5	65.7	174.0	28.8	65.3	36.5	-20.2	65.3	-437.7	65.8	265.4	30.4
WicketDS6A	300	295	167.7	76.8	65.6	129.5	84.2	34.9	126.1	-89	65.6	98.5	-75.9	66.2	-414.9	65.6	409.5	42.2
WicketDS6B	300	295	147.1	75	65.6	116.6	-85.2	29.1	107.7	-87.1	65.4	119.6	-76.2	65.4	-454.24	65.8	417.21	43.4
WicketDS6C	300	295	139.2	70.7	64.9	136.1	83.8	35.3	128.2	89.6	64.9	123.5	-73.4	64.9	-447.24	65.5	399.61	36.1
WicketDS6D	300	295	116.1	70.9	65	123.4	82.4	36.5	93.2	88.9	65.5	98.9	-76.1	66.1	-458.92	65.5	372.12	52
Averages for 5-ft head, 2GG			142.5	73.4	65.3	126.4	41.3	34.0	113.8	0.6	65.4	110.1	-75.4	65.7	-443.8	65.6	399.6	43.4
WicketDS33B	302	295	139.5	-85.4	65.4	194.2	-86.1	39.4	141.1	78.8	65.3	125.5	-70	39.4	-565.7	65.4	545	39.4
WicketDS38A	300	285	158.8	-88.2	53.7	423.7	-70.3	5.3	286.2	-87.9	7.4	391.7	-85.3	17.8	-788.3	64.3	1052.7	15.7
WicketDS38B	300	285	145.9	88.9	54	483.6	-88.1	1.6	353.6	-79.5	4.9	345.9	-79.3	11	-789.8	64.4	1046.9	11.3
Averages for 15-ft head, 1GG			162.4	0.4	53.9	453.7	-79.2	3.5	320.9	-83.7	6.2	368.8	-82.3	14.4	-789.1	64.4	1049.8	13.5
WicketDS38D	300	285	156.6	-89.9	4.2	535.7	88.8	4.8	290.8	-85.7	9.1	331.2	87.2	66.8	-801.1	64.4	978.2	12.2
WicketDS38E	300	285	193.1	-89.2	4.6	551.9	-87.8	4.1	257	-83	0.3	325.7	88.3	62	-793.6	63.7	955.7	6.5
WicketDS38F	300	285	277.8	-81.9	9.6	550.7	87.3	6.1	352	-87.7	9.7	338.3	-79.1	14	-767.9	64.7	1012.9	10.4
Averages for 15-ft head, 2GG			209.2	-87.0	6.1	546.1	29.4	5.0	299.9	-85.5	6.4	331.7	32.1	47.6	-787.5	64.3	982.3	9.7
WicketDS39A	300	290	153.6	-88.1	65.5	251.6	-77.5	3	120.4	-89.4	0.5	268.9	-89.3	60.6	-690	63.7	641.6	28
WicketDS39B	300	290	150.9	88.5	66.9	236.7	-69.3	4.5	135	83.7	1.6	283	-86.8	41	-689.2	64.6	688.2	27.3
WicketDS39C	300	290	100.1	84.4	64.6	271.5	-71.8	3.4	608.5	-88.3	28.1	235.6	-89.1	53.5	124	28.2	665.5	15.5
Averages for 10-ft head, 2GG			134.9	28.3	65.7	253.3	-72.9	3.6	288.0	-31.3	10.1	262.5	-88.4	51.7	-418.4	52.2	655.1	18.2
Series 2B: Bottom-Lift Drop Test (Prop supported partially raised wicket, downstream end of the gate was pushed with a 1 x 4)																		
(Horse parked at 65 deg and the gate rotated from ~15 to 65 deg)																		
WicketDS7A	0	0	134.8	-85.6	65.5	190.1	86.9	65.5	206.7	-72.7	65.5	164.9	-70.1	65.5	-200.1	65.4	325.1	66.2
WicketDS7B	0	0	97.6	-83.8	66.8	279.5	-88.7	65.4	190.3	-73.2	65.4	189.8	-71.6	65.4	-95	66.7	211.5	18.8
Averages for 0 head dry test			116.2	-84.7	66.2	234.8	-0.9	65.5	198.5	-73.0	65.5	177.4	-70.9	65.5	-147.6	66.1	268.3	42.5
WicketDS8A	295	295	75.3	-3.1	67.2	107	-85.8	66.1	123.9	-63.4	65.4	83.4	-57.9	65.5	-193.92	68.2	151.94	3.5
WicketDS9A	298	295	147	-69.7	65.6	69.7	78.8	0.4	113.8	-57.5	65.5	109	-34.9	65.6	-170.28	65.5	251.2	64.8
WicketDS10A	300	295	117.1	-54.8	66.2	170	-73	67.2	114.4	73.2	67	125.8	47	67.2	-528.52	67.3	243.85	42.7
Series 2B: Bottom-Lift Drop Test (Prop supported partially raised wicket, downstream end of the gate was pushed with a 1 x 4)																		
(Horse parked at 65 deg and the gate rotated from ~15 to 65 deg)																		
WicketDS12A	295	295	120.1	87.1	65.1	146.7	72.7	64.9	230.2	-85.4	65.1	140.4	-59.6	65.2	-339.36	65.1	102.71	65.2
WicketDS11A	298	295	146.1	-74.7	65	201.7	-61.1	65	232.7	86.9	65	149.8	-66.2	65.2	-691.4	65	229.51	65.1
WicketDS13A	300	295	230.3	-67.4	65.2	301	-66.4	65.1	324.7	87.2	65.1	256.9	-79.4	65.1	-831.1	65.1	299.62	65.1

(Continued)



Table 5 (Concluded)																		
File Name	Upstream Pool ft	Downstream Pool ft	Bottom Hinge						Top Hinge						Prop Force		Winch Cable Force	
			Right			Left			Right			Left			Prop Rod lbf	Corresp. Horse Angle deg	Max Lifting Force lbf	Corresp. Horse Angle deg
			Force lbf	Horse Angle deg	Phase Angle deg	Force lbf	Horse Angle deg	Phase Angle deg	Force lbf	Horse Angle deg	Phase Angle deg	Force lbf	Horse Angle deg	Phase Angle deg				
Series 3A: Bottom-Lift – Unusual Condition (Wicket in the down position)																		
(Horse was rotated from 0 to 65 deg. Gate was raised above water level from 0 to -35 deg)																		
WicketUS40A	300	300	287.6	-85	1.7	164.4	81.6	62.3	268.5	-84.1	1.7	309	79.2	66.3	-1114.3	66.3	187	4.3
WicketUS41A	300	290	166.5	-61.9	64.5	199	65.2	39.2	134.5	87.1	39.4	327.1	71.4	63.5	-422.9	65.9	490.3	31.3
WicketUS41B	300	290	174.6	-66.5	64.5	227.8	65.5	37.6	157.6	89.5	39.6	322.3	72.5	65.6	-586.3	65.7	510.6	31.5
WicketUS41C	300	290	191.7	-68.2	64	211.5	64.3	35.6	135.1	89.4	64	323.2	70.9	64.6	-580.3	65.4	507	36.5
Averages for 10-ft head, no gap			177.6	-65.5	64.3	212.8	65.0	37.5	142.4	88.7	47.7	324.2	71.6	64.6	-529.8	65.7	502.6	33.1
WicketUS42A	300	285	244.7	-69.5	29.1	307.2	-54.5	65.9	268.2	87.4	24.1	329	65.1	53	-363.9	65.5	778.4	14.6
WicketUS42B	300	285	244	-65	64.7	259.3	79.3	27.9	274.2	88.9	23.4	389	73.1	67.9	-997.8	67.6	768.8	22.9
WicketUS42C	300	285	247.8	-68.5	27.7	265.7	74.4	32.7	279	88.6	26.8	359.8	68.7	64.3	-620.4	66.5	801.8	19.1
Averages for 15-ft head, no gap			245.5	-67.7	40.5	277.4	33.1	42.2	273.8	88.3	24.8	359.3	69.0	61.7	-660.7	66.5	782.3	18.9
WicketUS14A	300	290	171.2	-63.2	65.2	187	71.8	36.4	135.7	-86.1	35.7	180.4	-51.6	45.2	-463.38	66.4	466.03	27.1
WicketUS14B	300	290	171.2	-71.3	63.4	179.4	79.5	33.8	145.3	-85.8	34.4	178.7	-49	50.4	-485.28	66.8	500.17	30.2
Averages for 10-ft head, no gap			171.2	-67.3	64.3	183.2	75.7	35.1	140.5	-86.0	35.1	179.6	-50.3	47.8	-474.3	66.5	483.1	28.7
WicketUS15A	300	285	205.1	-64.9	20.8	247	75.2	36.2	263.1	88.3	20.7	231	-64.6	23.3	79.7	5.2	784.31	20.8
Series 3B: Bottom-Lift Drop Test – Unusual Condition (Prop supported partially raised wicket, downstream end of the gate was pushed with a 1 x 4)																		
(Horse parked at 65 deg and the gate rotated from -38 to 65 deg)																		
WicketUS28A	296	295	536.2	-83.2	65.3	904.2	-58.5	65.3	824	74.6	65.3	829.9	-79.1	65.3	-1775	65.1	-84.3	65.2
WicketUS29A	300	295	751.9	-88.3	64.3	515.3	-60.4	68.7	570	78.1	64.4	364.3	-65.3	68.7	-5328.95	64.1	-23.23	65.2
Series 3B: Bottom-Lift Drop Test – Unlocked Prop (Downstream end of gate was pushed with a 1 x 4)																		
(Unlocked Horse 70 deg and the gate dropped)																		
WicketDS36A	300	300	126.2	81.1	64.7	109.8	-81.8	65.4	146.6	-89.5	64.7	240.6	80.5	65	-346.5	65	199.3	0.4
WicketDS34A	300	293	504.9	-84	1.6	274.2	87.3	43	627.7	-89.3	2.3	378	88.8	2.3	N/A	N/A	270	69.8
WicketDS35D	302	295	361.9	88.4	78.2	242.3	83.4	76.3	730	88.8	2.6	530.6	-89.5	2.3	N/A	N/A	357	70.2
WicketDS35E	302	295	453.7	-89.3	1.6	234.5	-87.5	77.7	792.3	89.3	2.7	483.1	-88.8	2.4	N/A	N/A	368	71.3
Averages for 7-ft head, 3GG			407.8	-0.4	39.9	238.4	-2.1	77.0	761.2	89.1	2.7	506.9	-89.2	2.4			362.5	70.8
NOTE: Hinge Force Angle was computed by atan y-component / x-component).																		



its peak response when the horse is locked at 65 deg as shown in Figure 41, and the corresponding magnitude was 801.1 lbf.

Figure 43 shows the variation of horse angle with respect to wicket angle as the top-lifted gate was raised from down to up position. For the top-lifted wicket (Series 1), the horse followed the gate as it was raised using the winch cable from the downstream end of the wicket. This figure indicates that the horse and the gate rotated concurrently during the top lifting operation. Horse and gate strains and accelerations at selected location are presented in Figures 44 through 49. These figures indicate that the horse and the gate strains remained relatively low during the operation, however, the acceleration of the gate during the positioning of the prop on the hurter reached a maximum value over 1g (g is the acceleration due to gravity, 32.2 ft/sec/sec) (see Figures 48 and 49). Upstream and downstream pool elevations during the course of the test are shown in Figure 50. As seen in this figure, there is a slight variation in pool levels (about 1 ft in prototype unit), which is about the experimental tolerance level in pool elevations that can practically be achieved in the model unit. Horse motion as a function of time is shown in Figure 51.

Maximum resultant force vectors for the horse pins for the top-lifted gate operation are presented in Figures 52 through 55. This resultant force variation corresponding to the horse angle is scanned to determine the occurrences of maximum amplitude and its location, (see data for test case WicketsDS38D in Table 5) during the course of wicket operation from down to up position. As shown in Figure 52 and in Table 5, for example, the maximum horse bottom right resultant reaction is 156.6 lbf at a phase angle of -89.9 deg when the horse is at 4.2-deg position.

Maximum resultant force vectors showing the magnitude and phase angle for the biaxial horse pins are computed from the orthogonal responses recorded for each pin using the equation shown below. As shown in the equation, a correction factor was used to compensate the analog output in a direction normal to its sensitive axis.

$$P_r = \sqrt{P_x^2 + P_y^2} - \left| \frac{E_{smaller}}{E_{larger}} \right| R_c \left| \frac{E_r}{E_c} \right|; \text{ where } \left| \frac{E_{smaller}}{E_{larger}} \right| \leq 1 \quad (1)$$

In which,

$P_r$  = resultant load, lbf

$P_x = E_x R_x$  = Force in the x-direction, lbf

$P_y = E_y R_y$  = Force in the y-direction, lbf

$E_x$  = Output signal in the x-direction, mv (mille-volts)

$E_y$  = Output signal in the y-direction, mv

$E_r$  = Resultant output, mv

$E_c$  = Output constant, mv

$R_x$  = Conversion constant for x component, lbf/mv

$R_y$  = Conversion constant for y component, lbf/mv

$R_c$  = Conversion constant, lbf

A detailed variation of load history as the gate was positioned on the hurter during the last few seconds of its journey is shown in Figure 56. In this figure, prop-rod force history and the corresponding horse angle variation at each instant of time are plotted. This plot present the time instant and the horse angle(right ordinate) at which the maximum prop-rod response(left ordinate) was impounded on respective pin during the positioning of the prop bottom end on the hurter. As seen in Figure 56 and in Table 5 (see case WicketDS38d), prop-rod attains its maximum load of 801.1 lbf when the wicket is parked at 65 deg.

Horse pin reactions, prop-pin load, and the cable forces for the bottom lifted operation (Series 2A) for the 5-ft head differentials with two-gate gap flow configuration are presented in Figures 57 through 62. Figures 57 to 60 show the ortho-normal reactions on the horse hinges. As discussed earlier, the maximum resultant forces for the hinge pins presented in Table 5 are obtained from the resultant force history, corresponding to horse rotational position, computed using Equation 1.

For the bottom lifted wicket operation (Series 2A and Series 3A), the wicket rotated at its pivot point as shown in Figure 63 during its lifting cycle from down to up position (Figure 7). Horse and gate strains and accelerations at selected locations are presented in Figures 64 through 72. As seen in these plots for bottom-lifting operation of horse wicket (Series 2A and 3A), sensor responses attained their highest magnitude during the impact due to dropping of prop-rod on the hurter slot (at 65 deg horse position). Figure 73 shows the pool elevations during the course of the experiments. As seen in this plot, pool fluctuations remained within a tolerance limit of  $\pm 1$  ft, prototype unit. During the course of rising, the horse was pulled up linearly with time as seen in Figure 74. In Figures 75 through 77, two plots are superimposed on top of each other to show the effect of impact due to prop positioning on the gate. As seen in these figures, the maximum fluctuation of response history occurred as the gate was positioned on the hurter during the last few seconds of its journey from down to up position.

Wicket responses for the bottom-lifting drop test (Series 2B) for the 5-ft head differentials with a two-gate gap flow condition are shown in Figures 78 through 91. As seen in these figures, unlike the raising gate operation discussed previously, this drop test results were presented in time domain instead of plotting as a function of horse angle. Series 2B bottom lifting drop test required data acquisition for a prop-supported gate, while the upstream end of the wicket is flipped from its up position as seen in Figure 90, (also Figure 28). As seen in these figures, for a relatively low head differential of 5 ft, substantial amount of response was attained as a result of slamming the wicket downstream end on the bumper block. During the course of this experiment, the wicket closed the gap by rotating clockwise from its horizontal position. The unusual drop test (Series 3B) caused clipping of accelerometer and strain data channels as indicated in Table 4. Clipping of data occurred when data signal exceeded the calibrated maximum range for respective data channel. Note that these high magnitude bumper block strains are based on reduced sensitive section as shown in Figure 33. The bumper

block as indicated in Table 4 was over ranged because of inelastic deformation during the unusual drop test experiments conducted in this investigation.

Experimental results for the unusual bottom lifted operation (Test #: WicketUS42B) for a 15-ft head differentials with a no-gate gap flow condition are plotted in Figures 92 through 104. Results for the unusual drop test of prop-supported partially raised wicket, (Test #: WicketUS29A) for a 5-ft head differential with no gate gap are shown in Figures 105 through 119.

As seen in the plots and in Table 5, these experiments produced an unusually high magnitude of responses on data channels. Horse strain, for example in Figure 110, exceeded  $1,500 \mu\text{-in./in.}$  Such a high magnitude of stress on horse bars may cause permanent deformation because of the exceedence of material yield limit. Gate acceleration (Figure 116) exceeded 50g, an unusually high impulsive response resulting from the slamming of bottom end wicket on the bumper block. Once the gate is flipped into the up position, (Figure 119), the entire flipping cycle took about 11 sec (model unit) from positioning the gate from a minus 40- to 65-deg engaged position. Figures 120 through 135 show the response variation for the bottom lift flipping test (unlocked prop) (Test #: WicketDS35E) for a 7-ft head differential three-gate gap flow case in which the gate was allowed to free fall from its unsupported position at 70 deg. Figures 132 and 133 show the gate and the horse angles as the gate was flipped during the course of the experiment. As seen in Figure 133, the free fall of the unengaged wicket took about 3.5 sec to drop the wicket in down position at el 278. This is why maximum impulsive responses for all recorded channels, as seen in Figures 120 to 131, occurred at the horse seated position, (0 deg). As seen in Figures 124 and 110, free fall of unlocked wicket did not induce horse strain more than that experienced during a low head differential drop test of prop-supported wicket. As shown in Table 5, bottom lift drop test for the prop supported partially raised wicket induced greater horse hinge reactions than those experienced by the hinges during free fall drop operation of unlocked wickets.

Horse gate responses resulting from unusual gate operations for which the bottom of the wicket was pushed down to flip the wicket into its up position far exceeded those responses to the normal top- and bottom-lifted operations. Reactions for unusual conditions, for example, are more than 10 times greater than that recorded for normal operations. Locations of the instrumentation gages and their corresponding gage designations are provided in Figures 29 through 33. It should be noted that all data reported in this document are in model units. Prototype equivalents of the model data may be obtained using the conversion factors provided in Table 3.

As discussed above, extreme loads resulting from unusual operation of the model at 5-ft head difference, (Series 3, Test # WicketUS29A) caused damage to the sensors used for the horse wicket. One horse pin was lost and few others were damaged. Also the prop-rod pin was damaged and needed replacement. Because of the concern for the serviceability of the horse gate model and its sensors, all requested tests for 10- and 15-ft head differences because of unusual conditions were postponed.

Impact resulting from unusual gate operation may strain the gate to its yield limit (e.g., Figures 110 to 113). It is possible that a repetitive impact will further deteriorate the condition of the gate. This suggests the need for an analytical investigation to determine the serviceability and effectiveness of the gate components because of such extreme operational loads.

Any possibility of lessening impact, during the unusual test, by using bearing mold must to be closely examined. Further experiments on the effectiveness of the new bearing mold are important to determine the severity of the impact and the resulting fatigue distress.

If the gate has to sustain extreme loads much higher than the one recorded for 5-ft head difference (Series 3B, Test # WicketUs29A Condition), then it is imperative to investigate the fatigue distress for the gate and the bumper block. The recorded strain data can be further processed to study the fatigue capability of the gate and the bumper block. Such a fatigue analysis, however, needs an analytical model to determine the true strain distributions on the bumper block, since the recorded strain was based on a modified cross section as shown in Figure 33.

## Bumper Block Results

The strain measured for the bumper block is based on a modified design of the bumper block, which is much different from the actual cross section of the actual bumper. Figure 33 shows the modified cross section in which the upper portion of the bumper is connected only through the edges on the base plate. These sensitive edges were designed such that all loads impacted on bumper blocks will transfer to the base through instrumented stems connecting the upper portion to the base plate. The strain gages are installed on the rectangular cross sections that connect the upper portion of the bumper block to its base. This modification was required for knowing the cross-sectional area through which the impact load from the gate is transferred to the base plate fastened to the sill. As shown in Figure 33, two types of strain gages were used to measure the shear forces transmitted through the instrumented edges. The strain gages measured the shear forces based on shear angle distortion of the sensitive stem of the bumper block and bending moment bridge measured the shear based on the bending stresses.

Figures 136 through 143 shows the bumper block shears using the shearing and bending strains measurements. Figures 136 through 137 show the shear force transmitted through the sensitive section of the bumper block using the shearing strain data for 3-ft head differentials bottom flip test. Redundant information on the shear forces due to impact was also obtained using the bending strain data and is shown in Figures 138 and 139 for the 3-ft head differential experiment. The sum of both shears (left and right data) is the total shear transmitted through the bumper. This total shear load needs to be applied on an analytical model of the actual bumper block cross section for determining the true distribution of the strain during actual operation. As seen in the figures, there is a difference between the estimated shears computed using the bending and shearing strain

measurements. For example, the right and left shears estimated using the bending strain data are about 6.5 and 5.5 kips, respectively. The strain data, however, indicates that 4.7 and 6.0 kips were induced on the right and left stems of the bumper block during impact of the bottom gate end onto it. The discrepancy between the shear estimates using the shearing and bending strains resulted from errors in estimating the moment arm used for computing the bending moment at the bending gage axis as a result of the implied impact load. The shear estimates using the bending strain gage is an indirect measurement in which the moment arm of the impact force between its axis of application on the bumper block and the axis of gage location were required to be approximated. Figures 140 through 143 show the shear force transmitted through the sensitive section of the bumper block using the shearing strain data for 5-ft head differentials bottom flip test.

## **Gate Top Corners Movement**

Displacements for the top right and left corners of the gate (looking upstream from downstream side of the flume) for four head differentials ( 3, 5, 10, and 15 ft) were presented in Figures 144 through 151. Displacement data are obtained by integrating the velocity measurements data using a point laser vibrometer (VH-300) system. The top gate motions for the tests examined in the series are relatively negligible. The recorded data indicates that the maximum gate top movement relative to one gate corner, was no more than 0.31 mm (1.55 mm for the prototype) for a 15-ft head differential cases experimented in this investigation.

## 4 Observations and Conclusions

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The experimental results for the proposed Olmsted dam operations of the 1:5-scale horse wicket model are presented in this document. No significant operational problem was discovered during the normal dam operations investigated in this study. This included top and bottom lifting of horse wicket for 3-, 5-, 7-, 10- and 15-ft head differentials. The horse wicket and the proposed lifting and installation procedures proved to be adequate.

It should be noted, however, that extreme care must be taken while closing the gap using the bottom held (upstream end) winch cable. Extreme loads resulting from unusual bottom lift drop experiments of the model at 5-ft head difference - for which the bottom of the wicket was pushed down to flip the wicket into its up position - caused damage to the sensors used for the horse wicket. Impact because of unusual drop of wicket may strain the gate to its yield limit. It is possible that a repetitive impact will further deteriorate the condition of the gate. Any such operation anticipated during the dam operation warrants an analytical investigation to determine the serviceability and effectiveness of the gate components resulting from such extreme operating loads. Because of the concern for the serviceability of the horse gate and its components, any operations of the wicket requiring dropping of the wicket bottom end (upstream side) for high head differentials must be restricted.

Any possibility of lessening impact, during the unusual test, by using bearing mold needs to be closely examined. Experiments on the effectiveness of the bearing mold are important to determine the severity of the impact and the resulting fatigue distress. Particularly, the impact from the dropping of the prop-rod on the hurter slot during bottom lift operation could be reduced by the use of such bearing mold.

A fatigue analysis of the bumper block can be made using the data recorded in this investigation. An analytical model is needed to determine the true strain distributions on the bumper block since the recorded strain was based on a modified cross section. The strain measured for the bumper block is based on a reduced sensitive section, which is much different from the actual cross section of the actual bumper. This modification was required for knowing the cross-sectional area through which the impact load from the gate is transferred to the base plate fastened to the sill. An analytical model of the actual bumper block cross section is needed to determine the true distribution of the strain during actual operation.

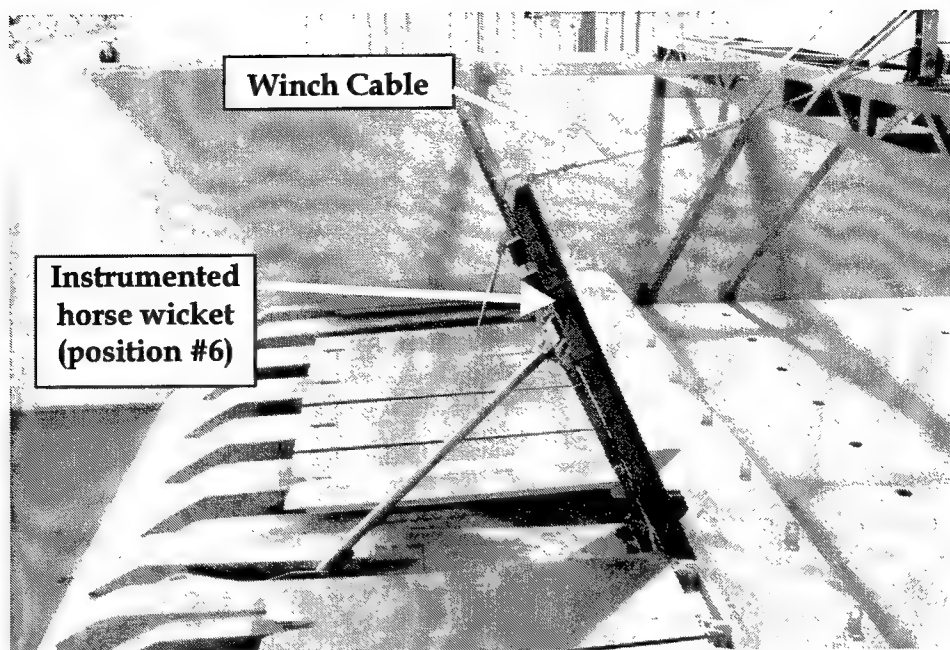


Figure 1. Dry bed view looking from left side. Cable attached to top of gate. Gate in the operating or raised position at 65 deg

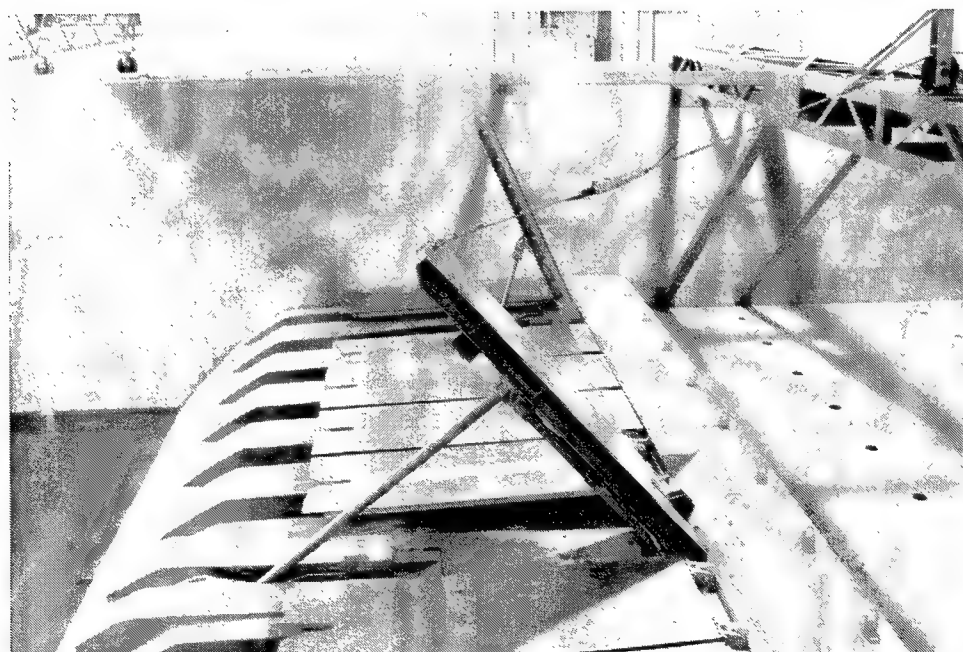


Figure 2. Dry bed view looking from left side. Cable attached to top of gate. Gate angle is approximately 45 deg

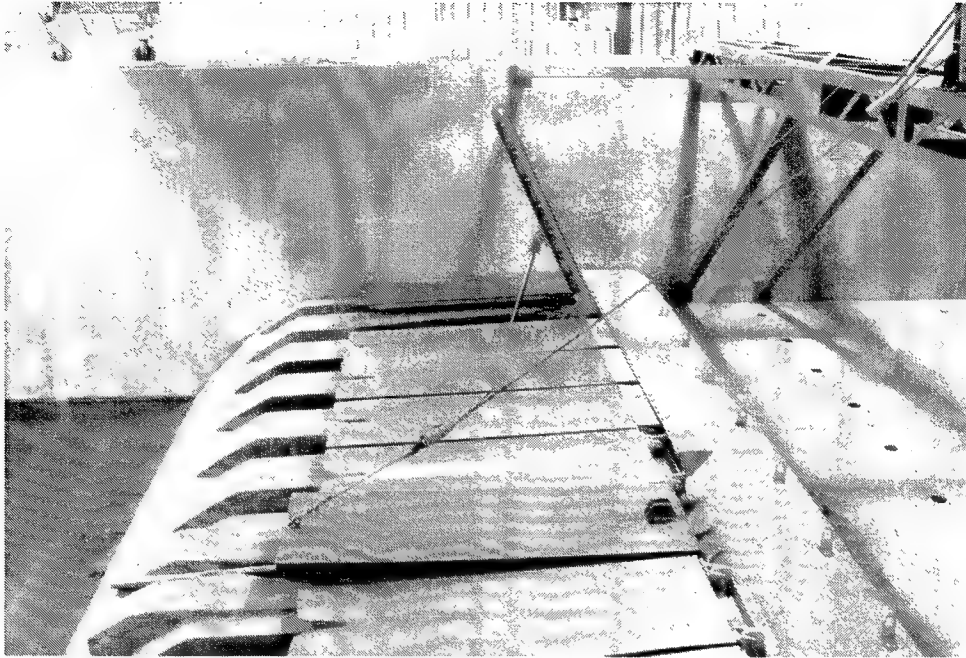


Figure 3. Dry bed view looking from left side. Cable attached to top of gate. Gate in the down position at 0 deg





Figure 4. Dry bed view looking from left side. Cable attached to bottom of gate. Gate raised to 65 deg



Figure 5. Dry bed view looking from left side. Cable attached to bottom of gate. Prop-rod set in hurrer. Gate pivoted in horizontal position to 0 deg

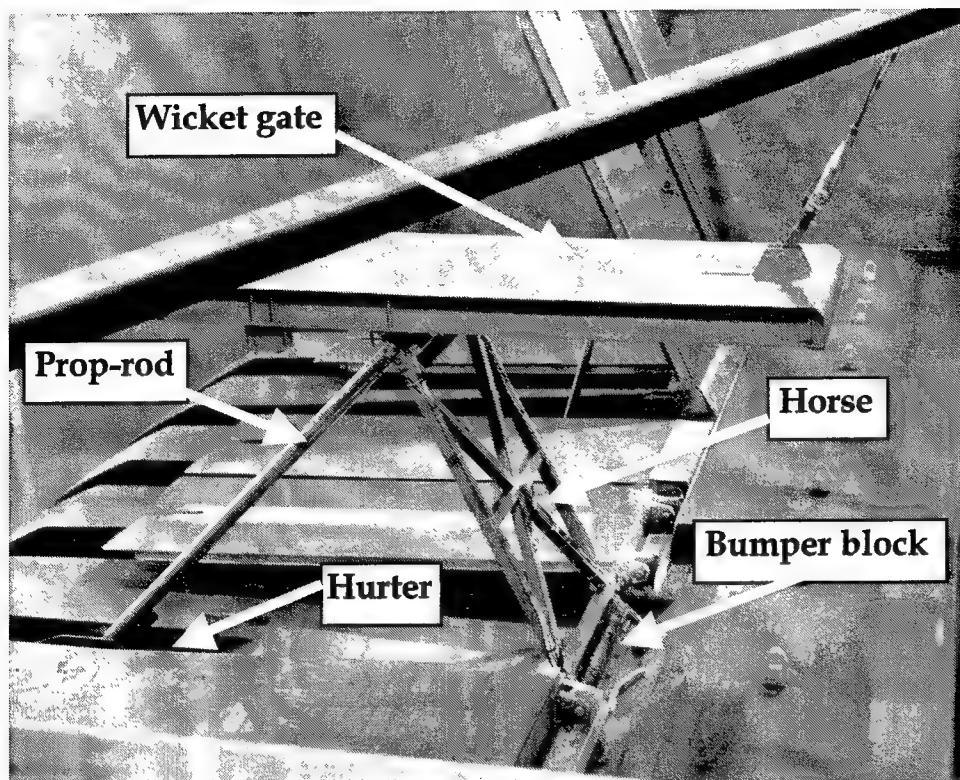


Figure 6. Dry bed view looking from left side and slightly upstream. Cable attached to bottom of gate. Prop-rod set in hurter. Gate pivoted in horizontal position to 0 deg



Figure 7. Dry bed view looking from left side. Cable attached to bottom of gate. Gate position near start of lowering operation



Figure 8 Dry bed view looking from left side. Cable attached to bottom of gate. Gate near lowered position



Figure 9. Dry bed view looking from left side. Cable attached to bottom of gate. Gate in lowered position



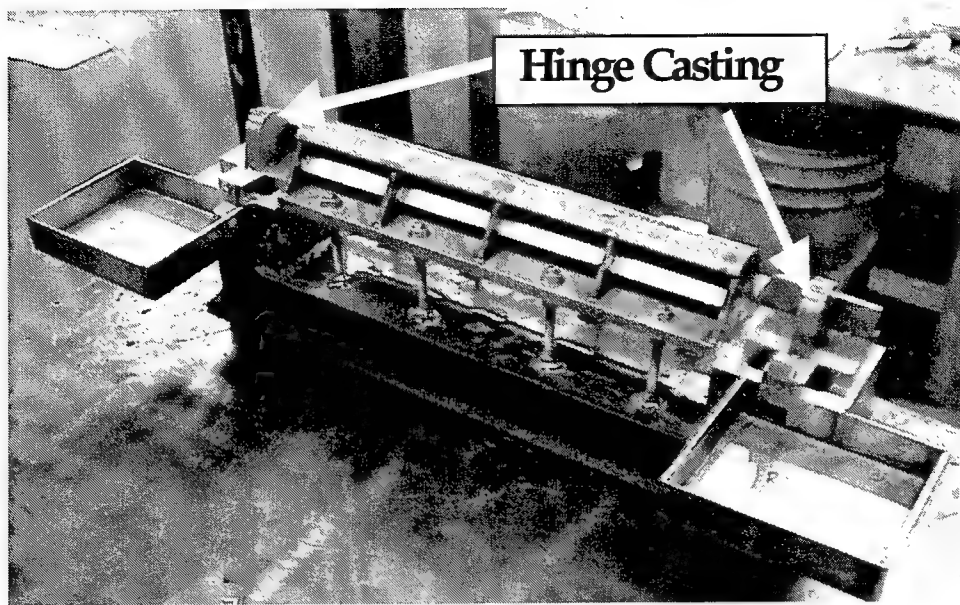


Figure 10. A front view of the assembled embedded sill components.  
Embedded frame attachments to the bumper block and hinge casting

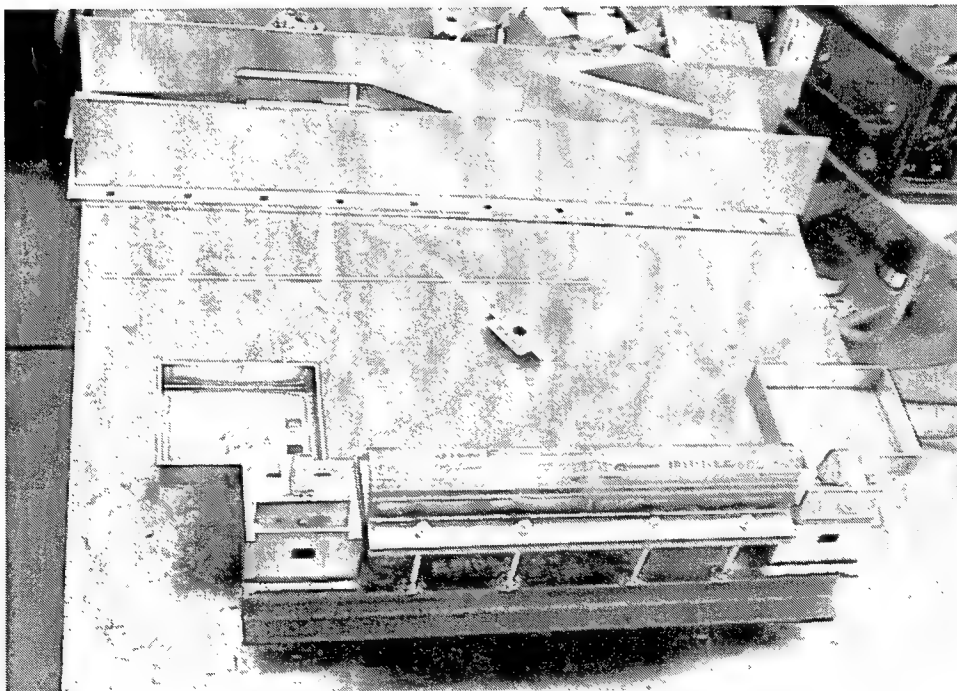


Figure 11. A rear view of the assembled embedded sill components



Figure 12. Fabricated hurter block



Figure 13. Rear and front view of the bumper block



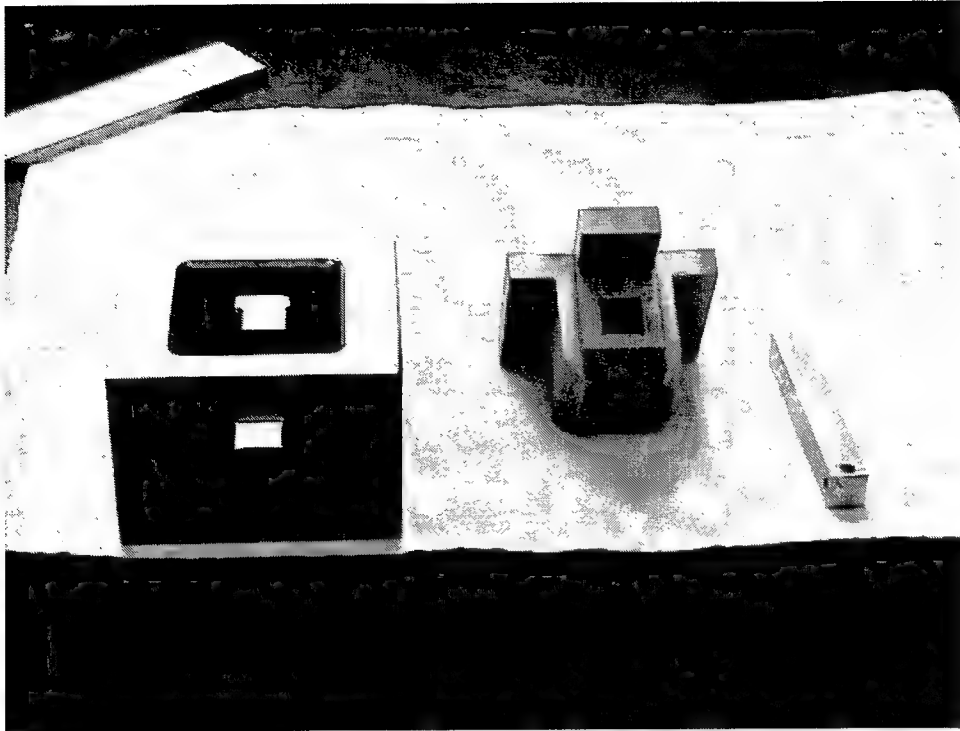


Figure 14. Hinge casting and its components

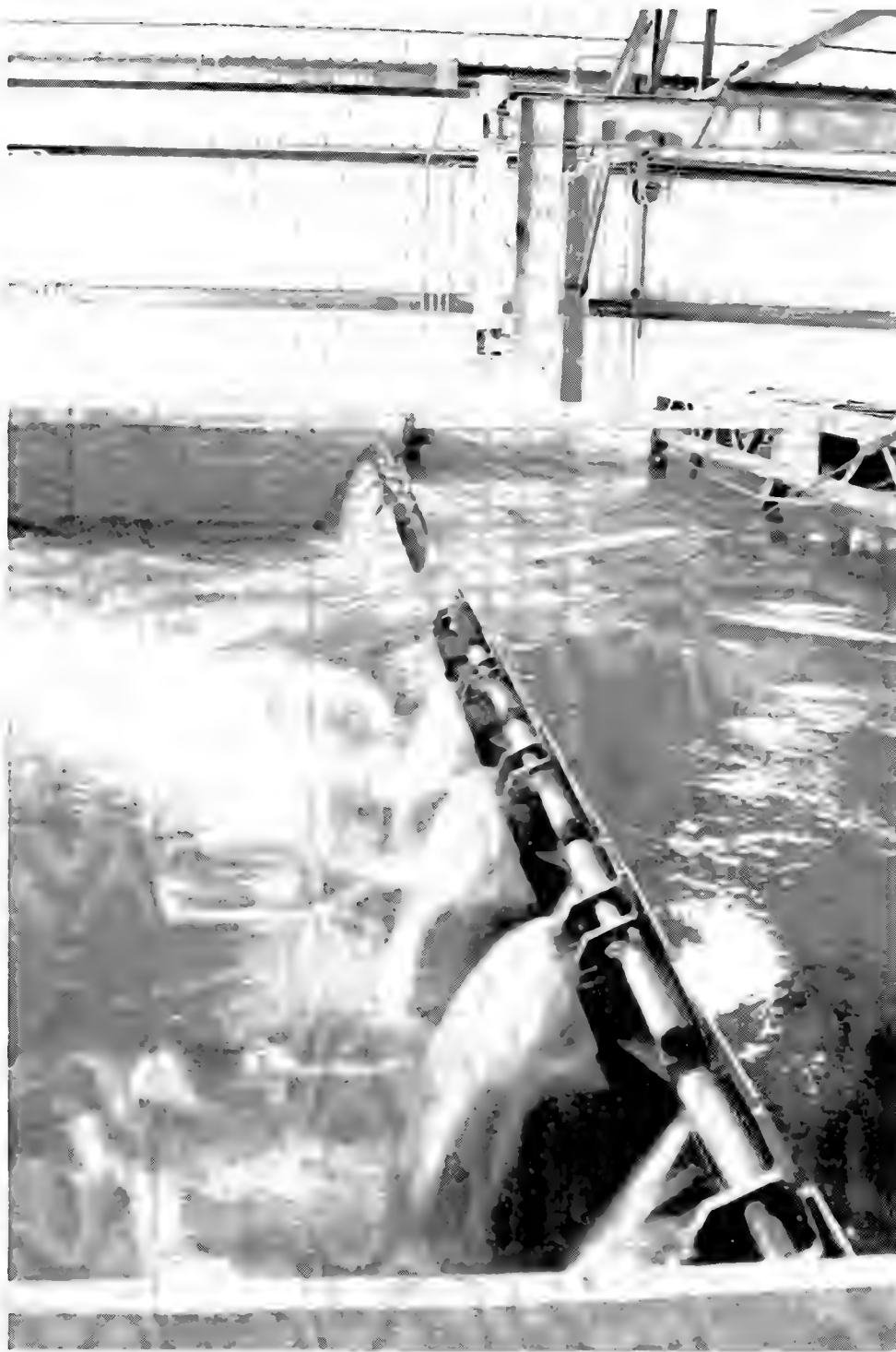


Figure 15. Pool el 300, tailwater el 295. View looking from left side. Cable attached to top of gate. Gate lowered to 0 deg



Figure 16 Pool el 300, tailwater el 295 View looking from left side Cable attached to top of gate. Gate is being raised and about to break water surface

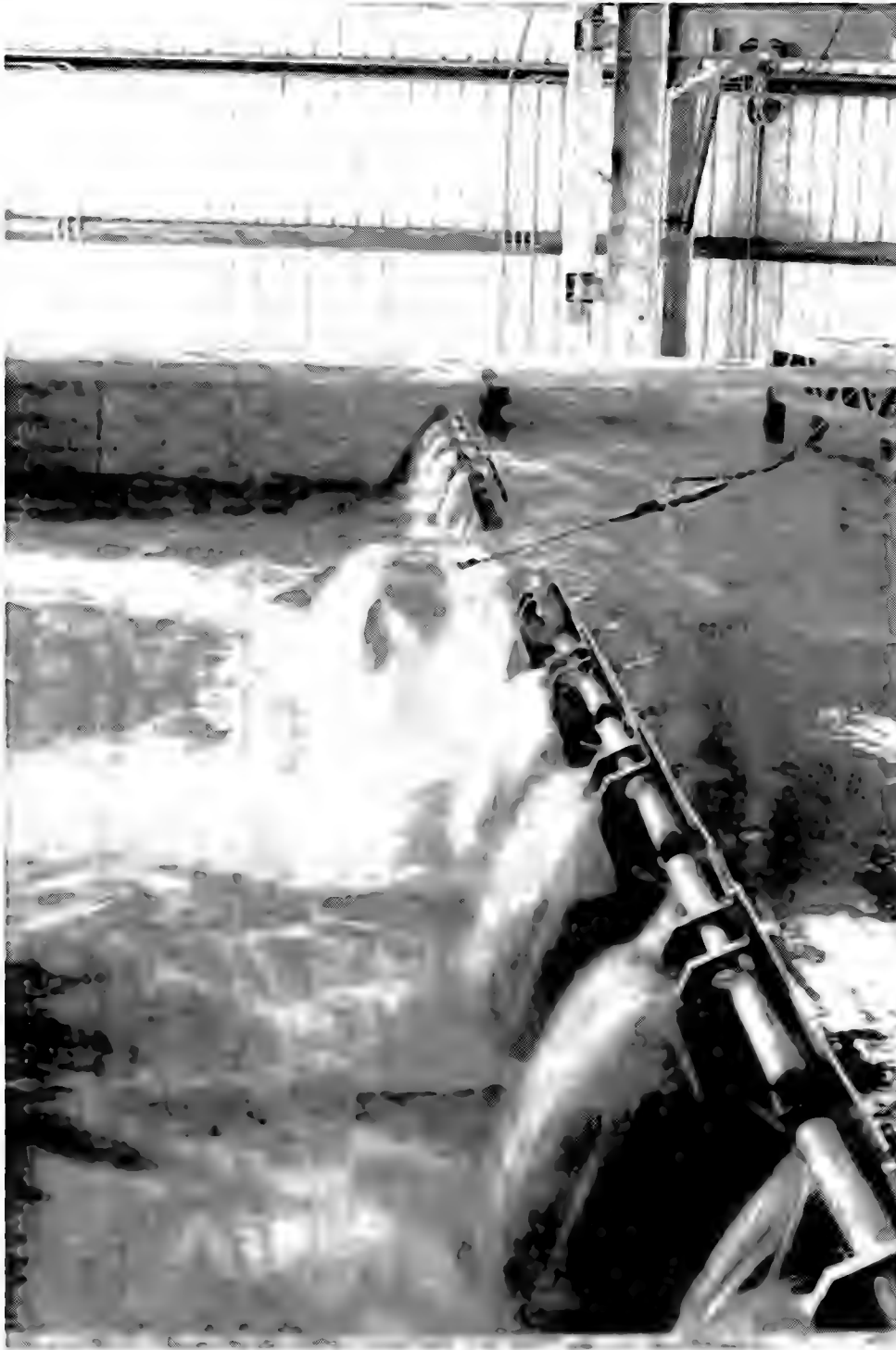
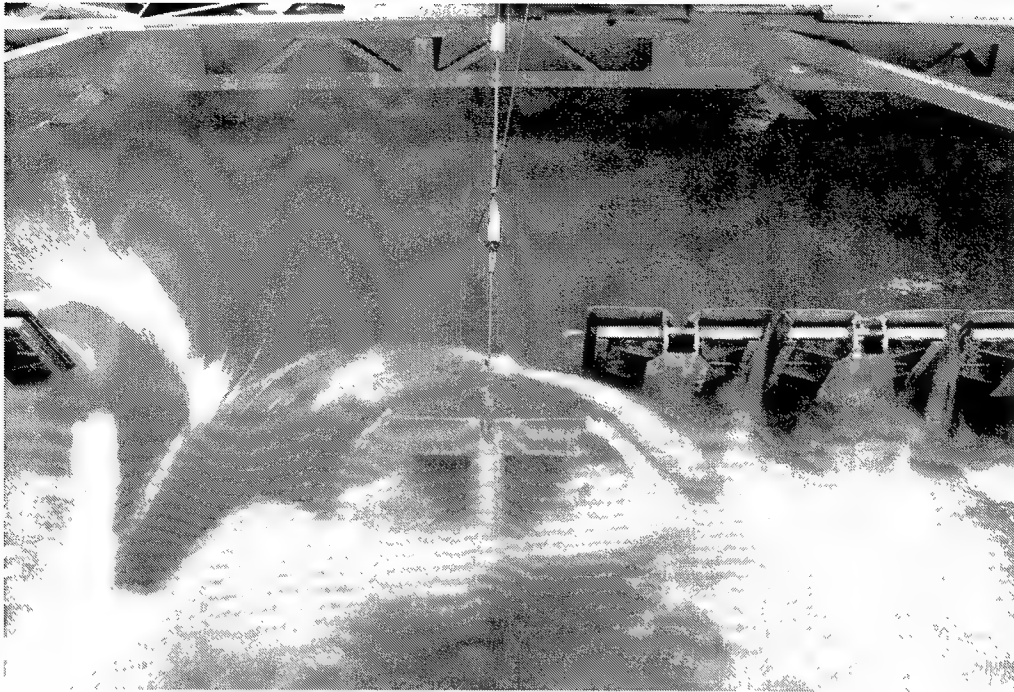


Figure 17 Pool el 300, tailwater el 295. View looking from left side. Cable attached to top of gate. Gate position near 60 deg



Figure 18 Pool el 300, tailwater el 295. View looking from left side Cable attached to top of gate. Gate position near 70 deg



**Figure 19.** Pool el 300, tailwater el 295. View looking upstream. Cable attached to top of gate. Gate position near 60 deg



Figure 20 Pool el 300, tailwater el 295. View looking from left side. Cable attached to top of gate. Gate in operating position at 65 deg



Figure 21. Pool el 300, tailwater el 295. View looking upstream. Cable attached to top of gate. Gate in operation position at 65 deg



Figure 22. Pool el 300, tailwater elevation 295. View looking from left side. Cable attached to bottom of gate. Gate lowered to 0 deg





Figure 23. Pool el 300, tailwater el 295. View looking from left side. Cable attached to bottom of gate. Bottom of gate near water surface



Figure 24. Pool el 300, tailwater el 295. View looking from left side. Cable attached to bottom of gate. Gate raising, gate position just prior to prop-rod setting in hurter



Figure 25. Pool el 300, tailwater el 295. View looking from left side. Cable attached to bottom of gate. Gate raising, gate position with prop-rod set in hurter

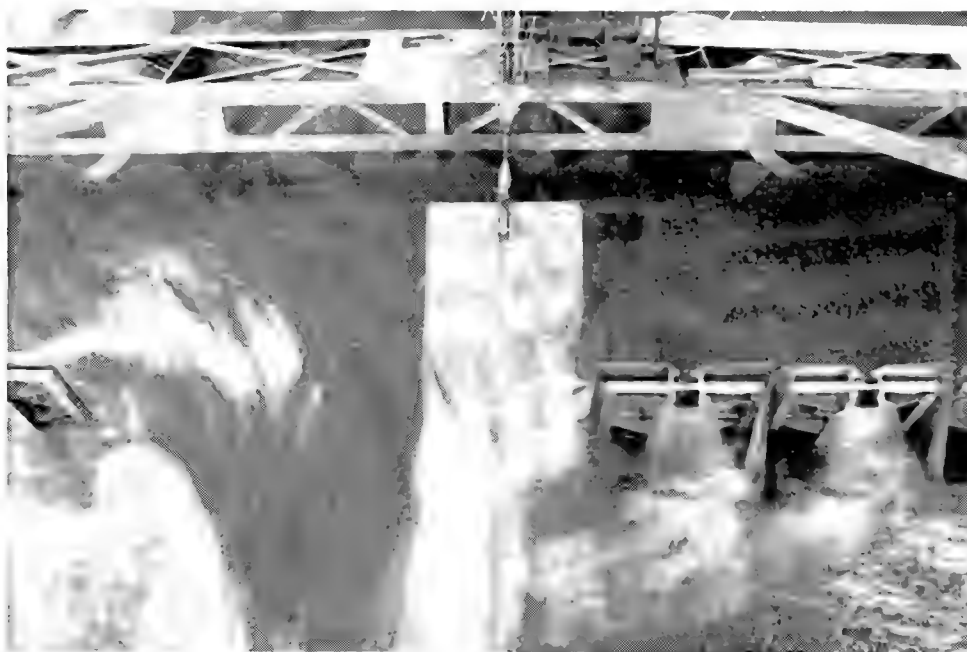


Figure 26. Pool el 300, tailwater el 295. View looking upstream. Cable attached to bottom of gate. Gate raising, gate position with prop-rod set in hurter



Figure 27. Pool el 300, tailwater el 295. View looking from left side. Cable hooked to bottom of gate. Gate in operating position at 65 deg

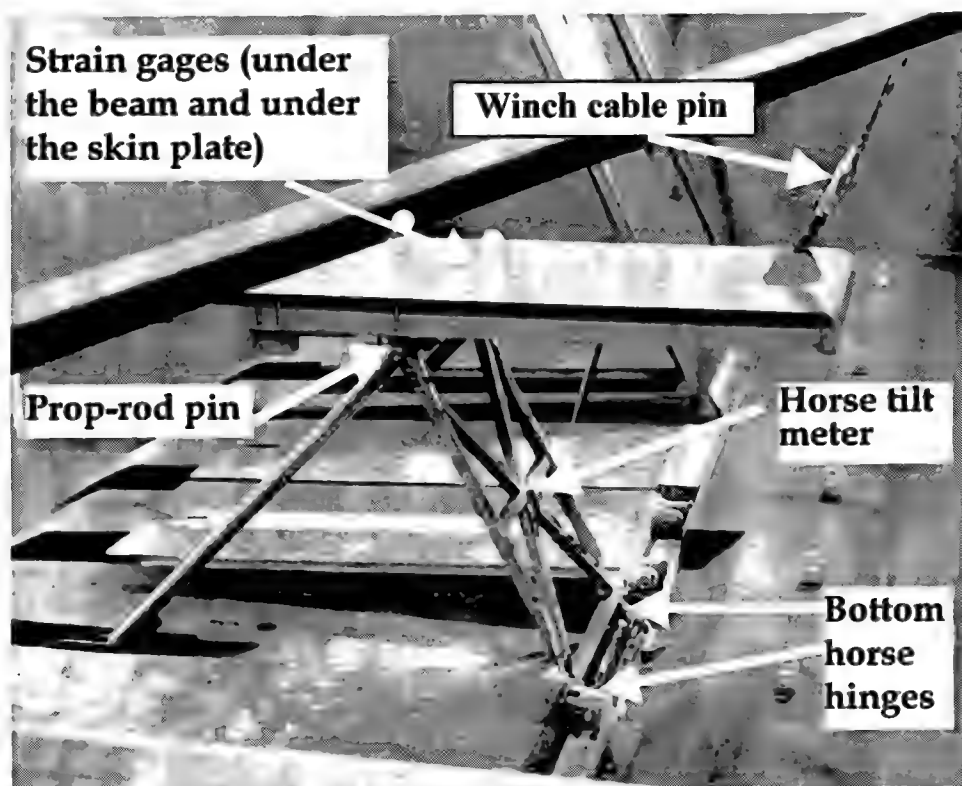


Figure 28. General layout of instrumentations on the horse wicket model

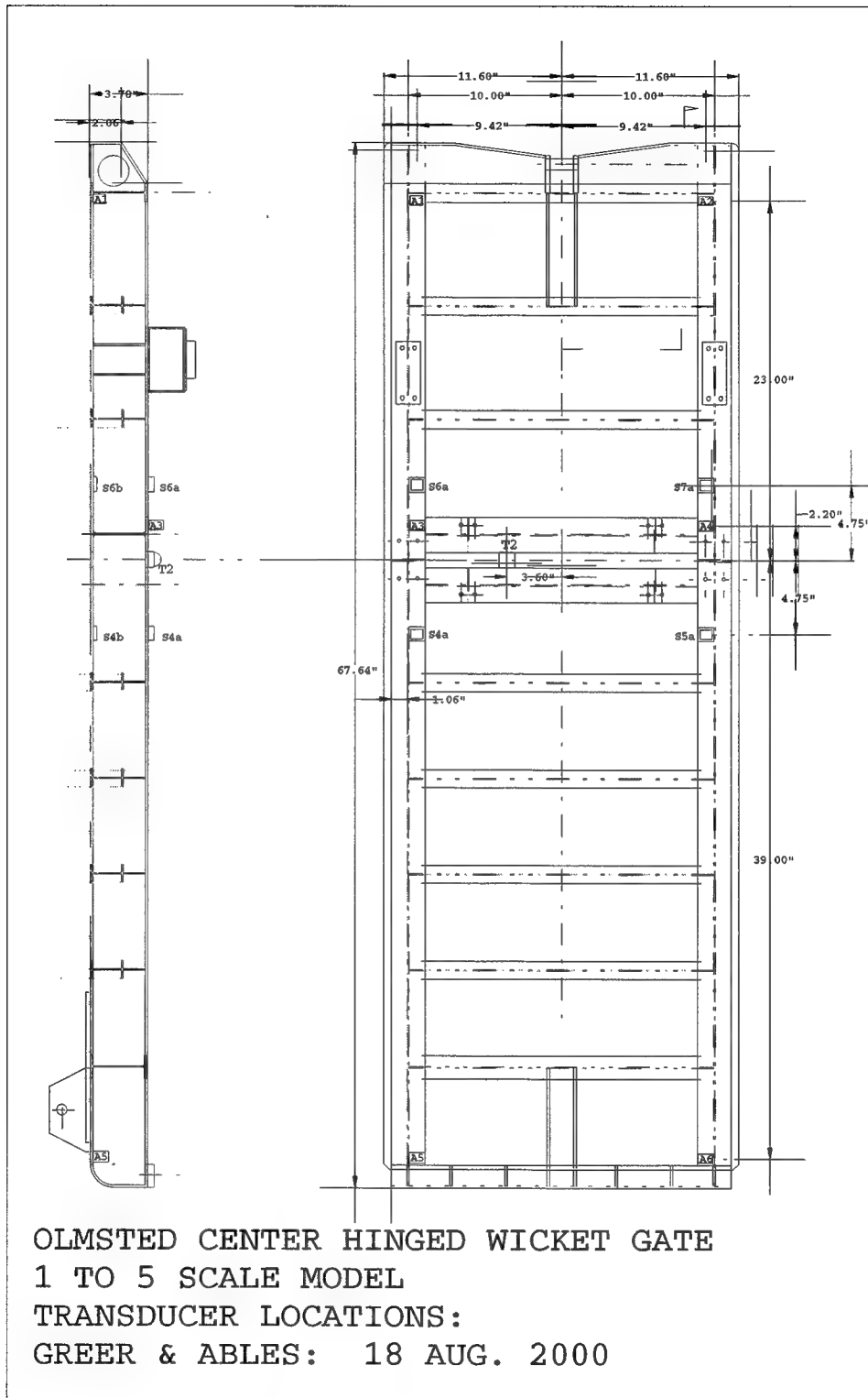
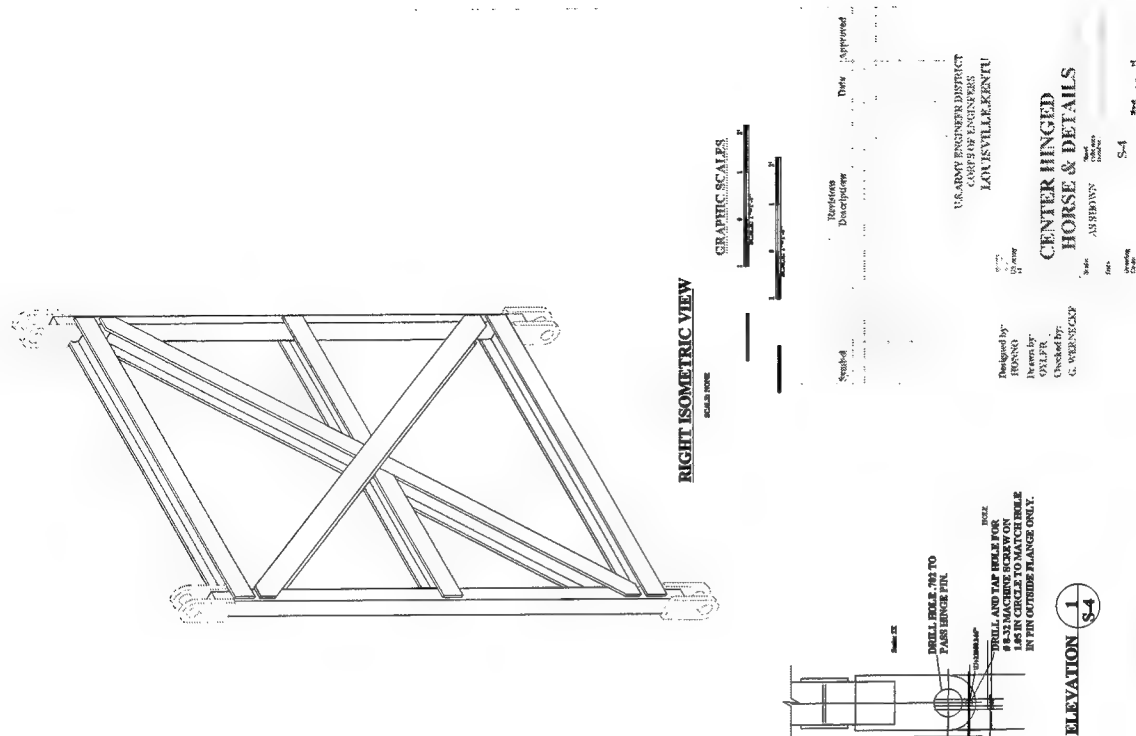
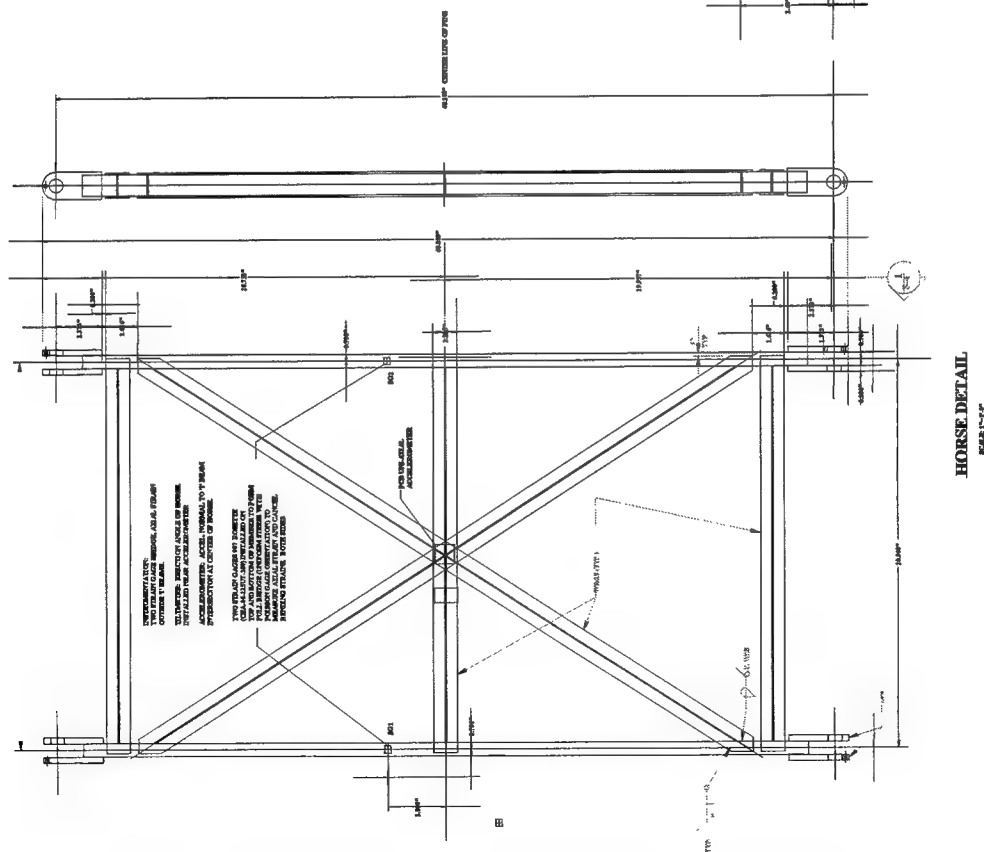


Figure 29. Transducer locations on the horse wicket model (S- strain gages location, A- accelerometer locations)

# MODIFIED FOR 1-5 SCALE MODEL



**Figure 30. Transducer locations on the horse**





Figure 32. Strain gage locations on the modified bumper block for measuring the impact stresses resulting from drop test

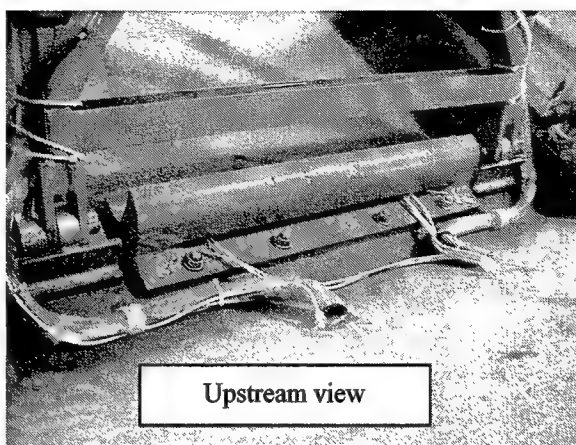
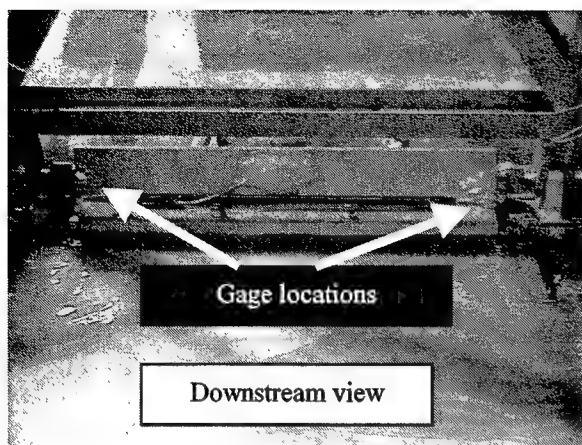


Figure 33. Downstream and upstream views of the instrumented bumper block. Bumper block is mounted on the sill

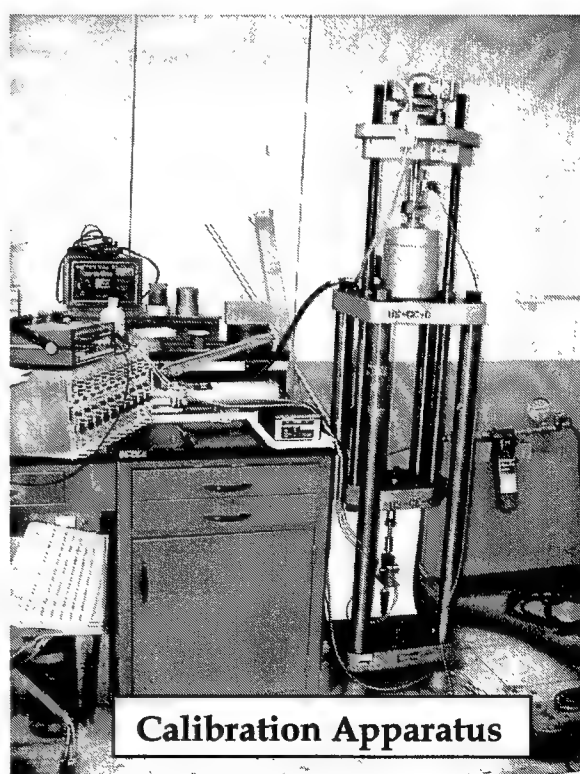
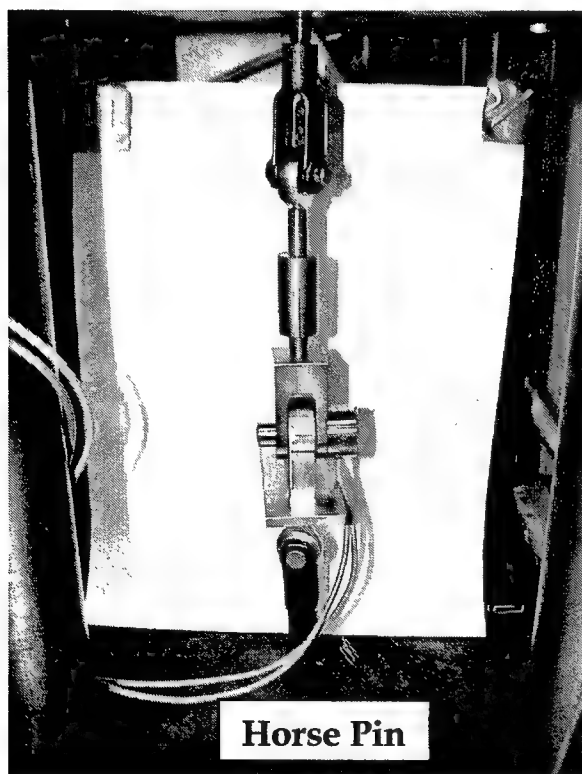


Figure 34. A typical calibration test setup showing a horse load pin being calibrated in the laboratory



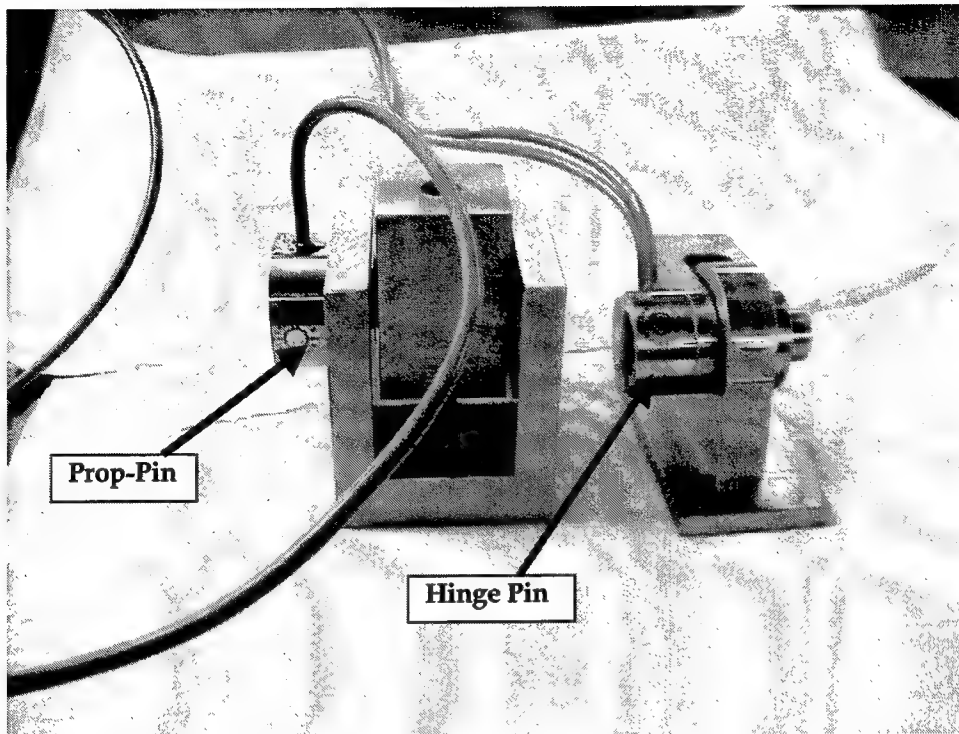


Figure 35. An illustration of the mounting of load pins on the gate

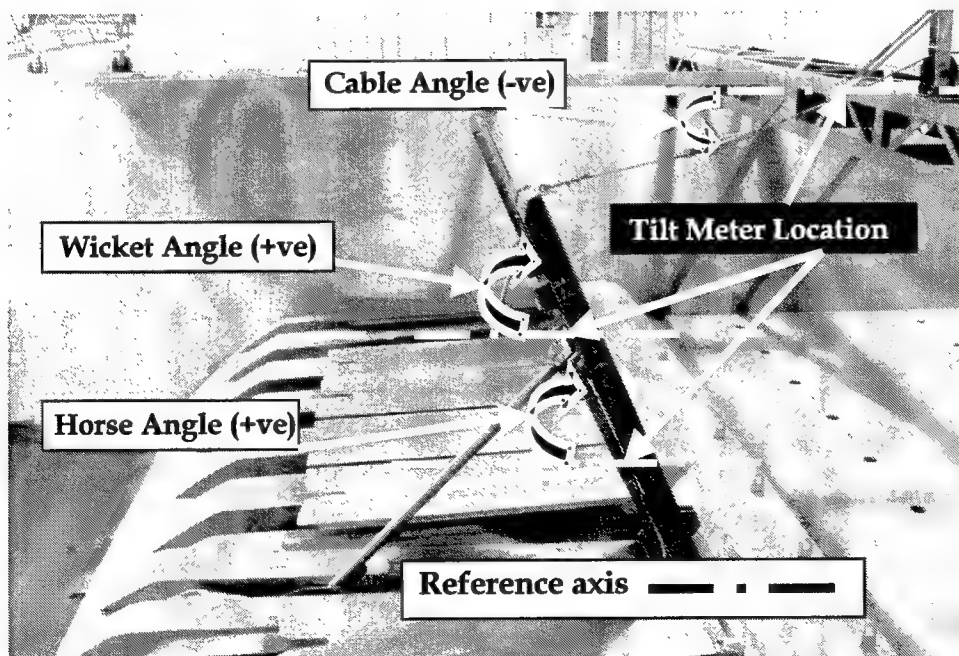


Figure 36. Angular orientation of tilt meter measurements

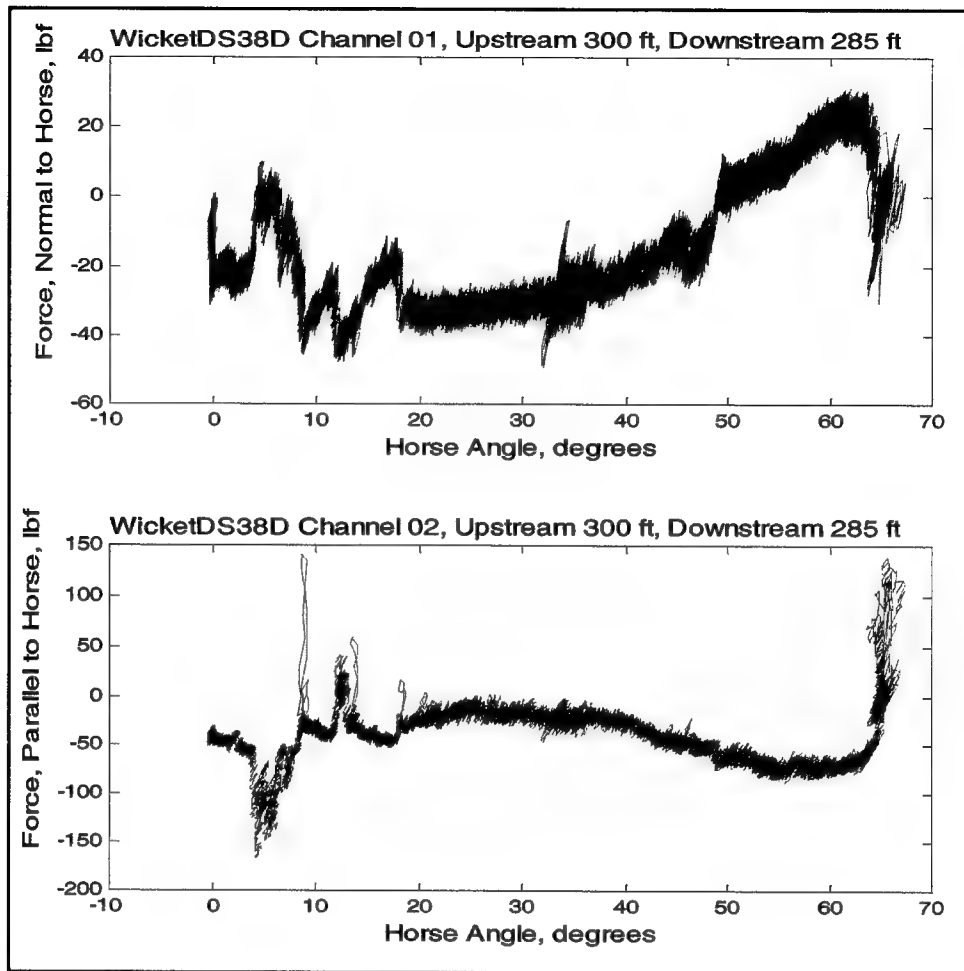


Figure 37. Horse bottom right hinge reactions – top-lifted, 2-gate gap

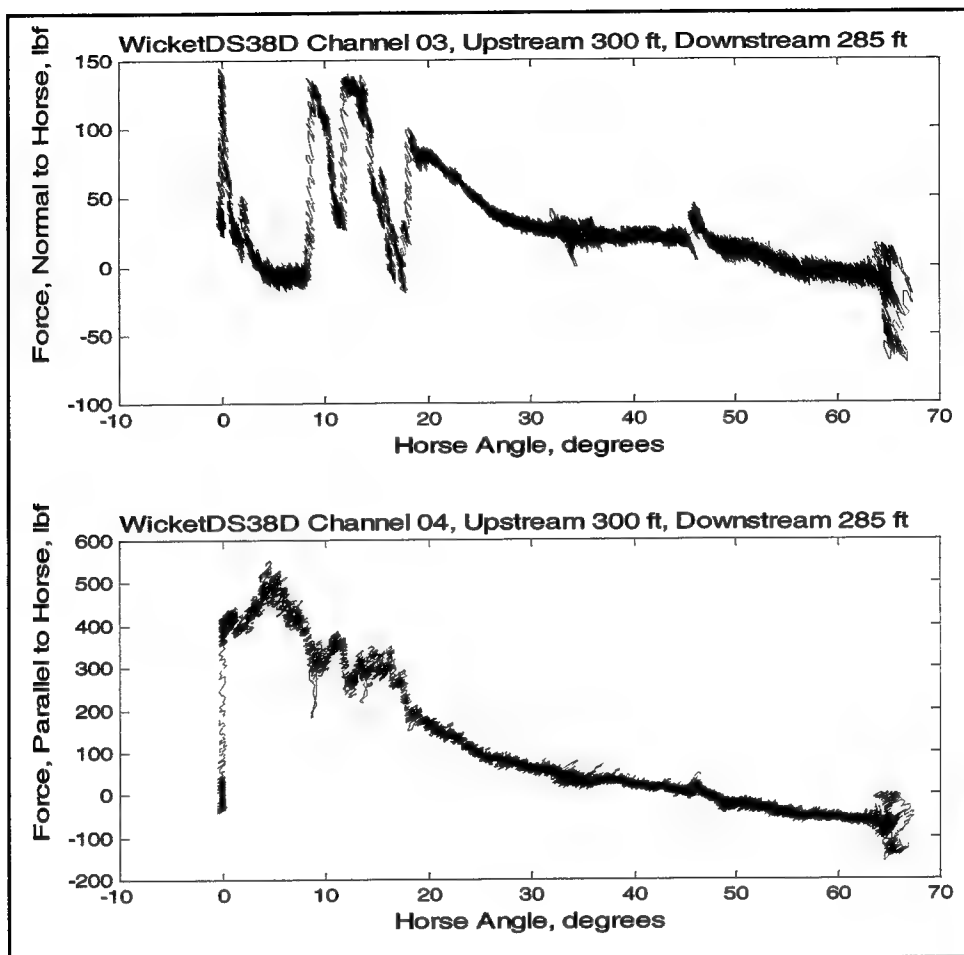


Figure 38. Horse bottom left hinge reactions – top-lifted, 2-gate gap

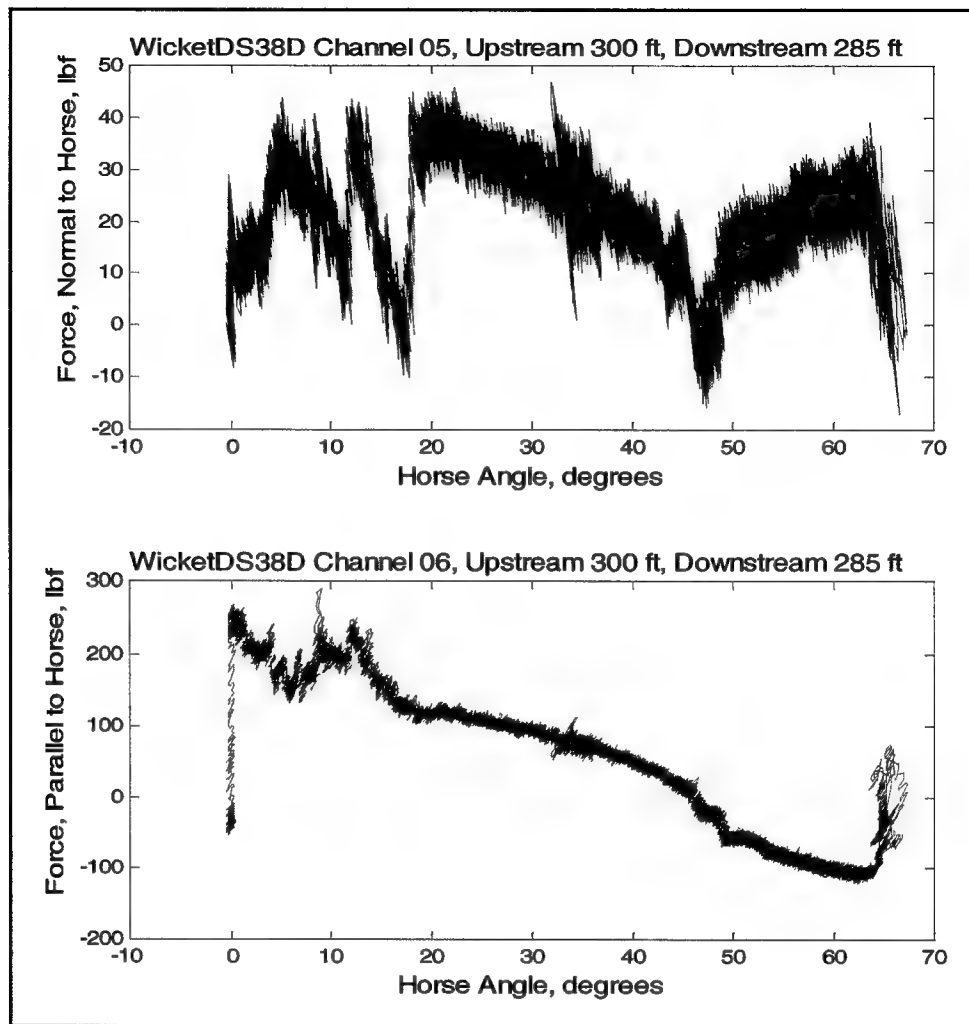


Figure 39. Horse top right hinge reactions – top-lifted, 2-gate gap

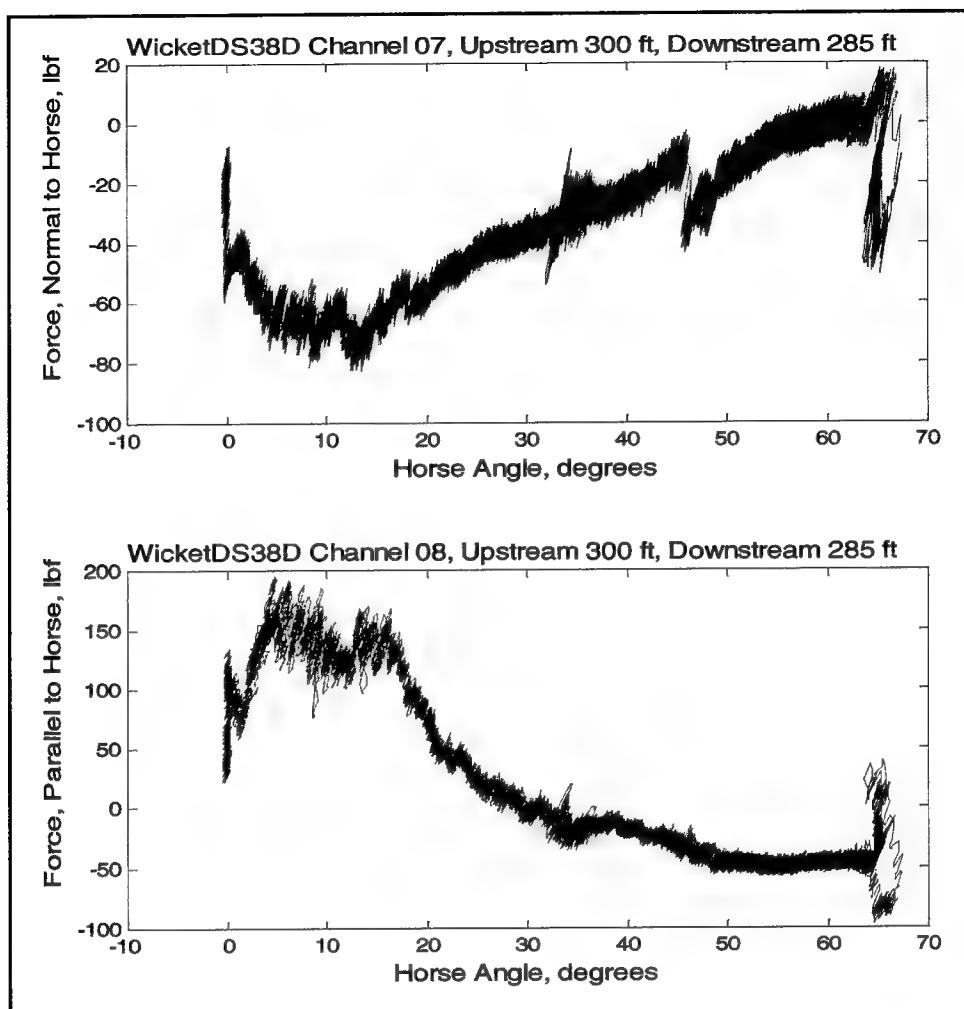


Figure 40. Horse top left hinge reactions – top-lifted, 2-gate gap

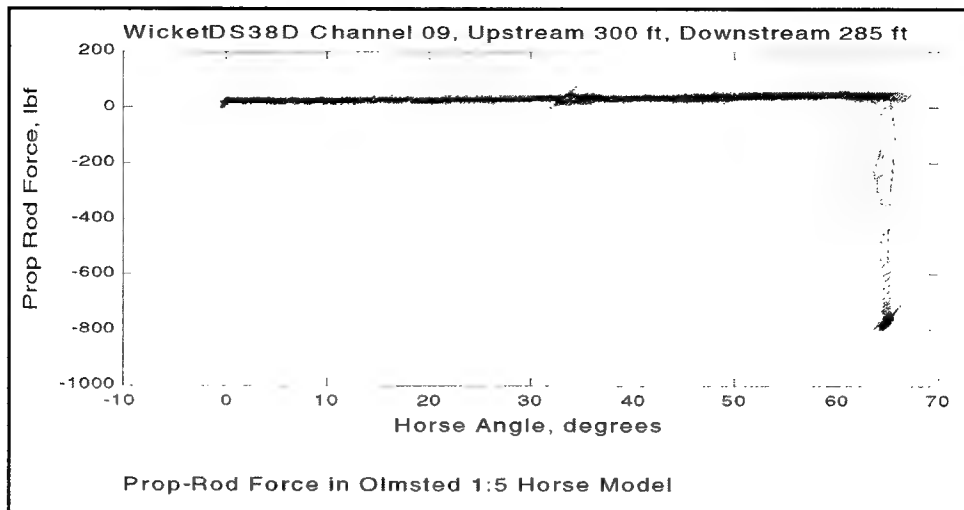


Figure 41. Prop-rod force – top-lifted, 2-gate gap

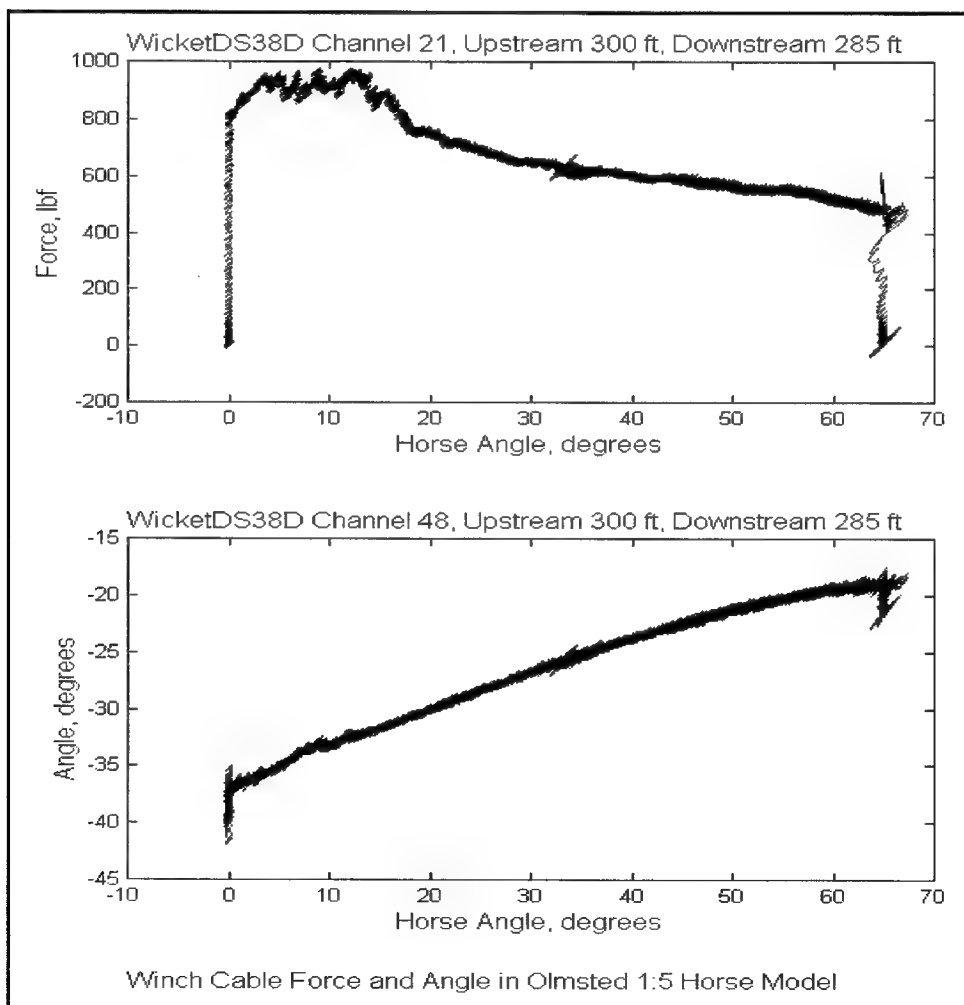


Figure 42. Winch cable measurements, top-lifted, 2-gate gap

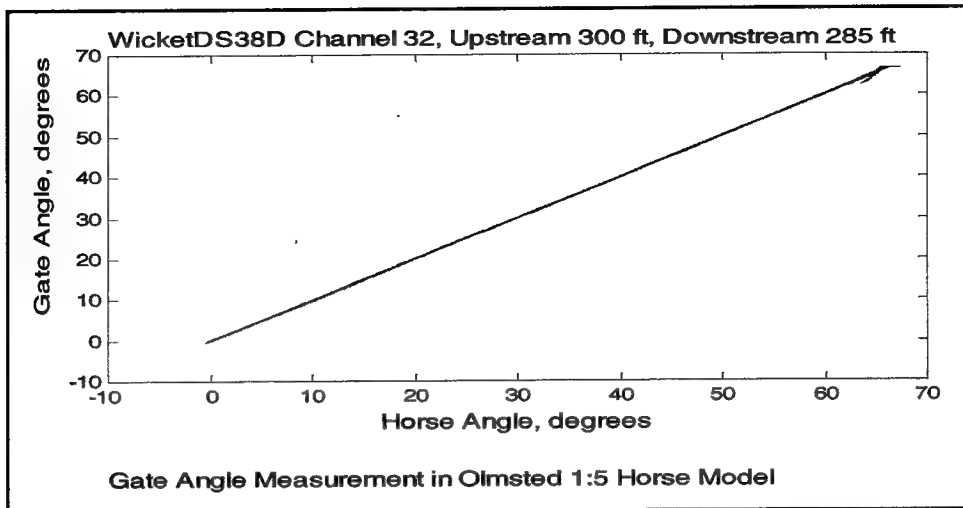


Figure 43. Gate angle as a function of horse angle, top-lifted, 2-gate gap

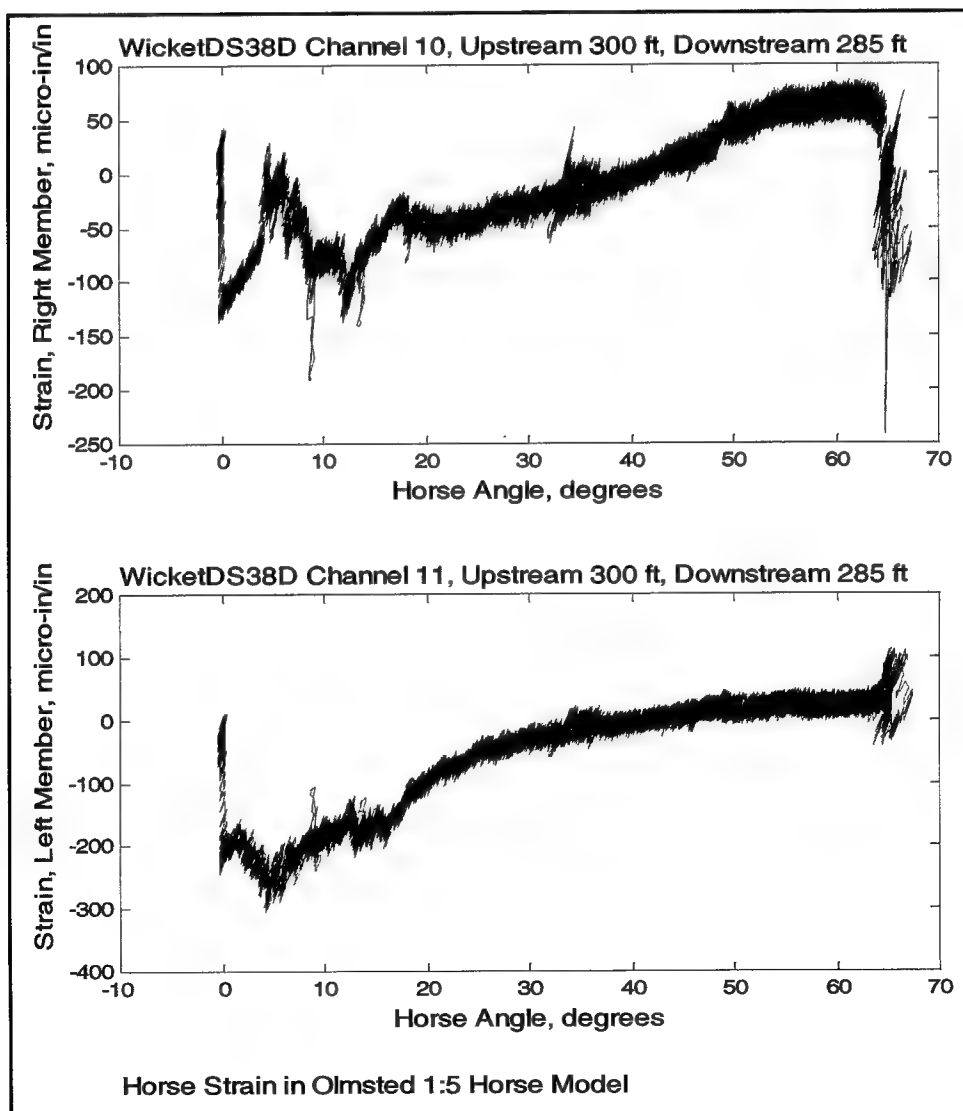


Figure 44. Horse strain on parallel bars, top-lifted, 2-gate gap

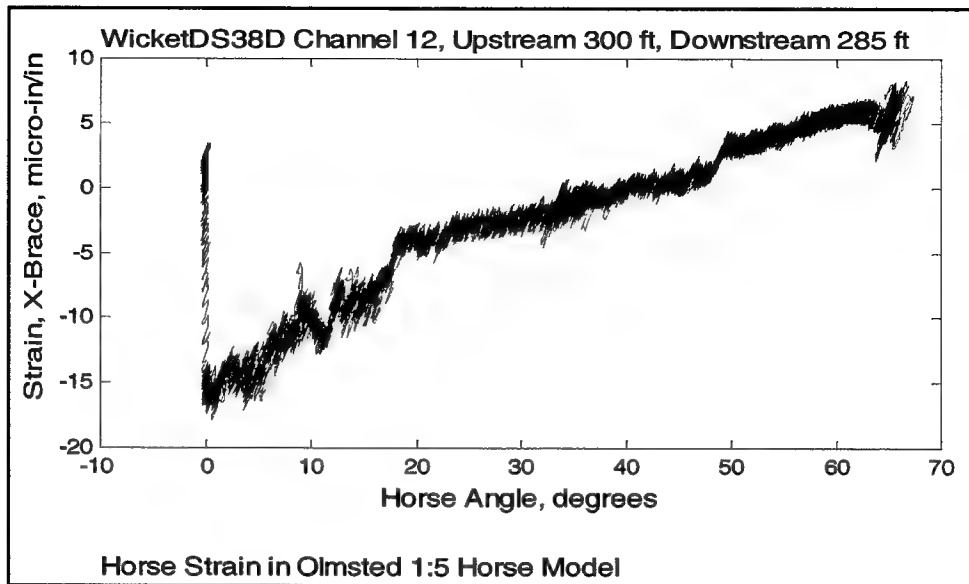


Figure 45. Horse strain on cross-bracing, top-lifted, 2-gate gap

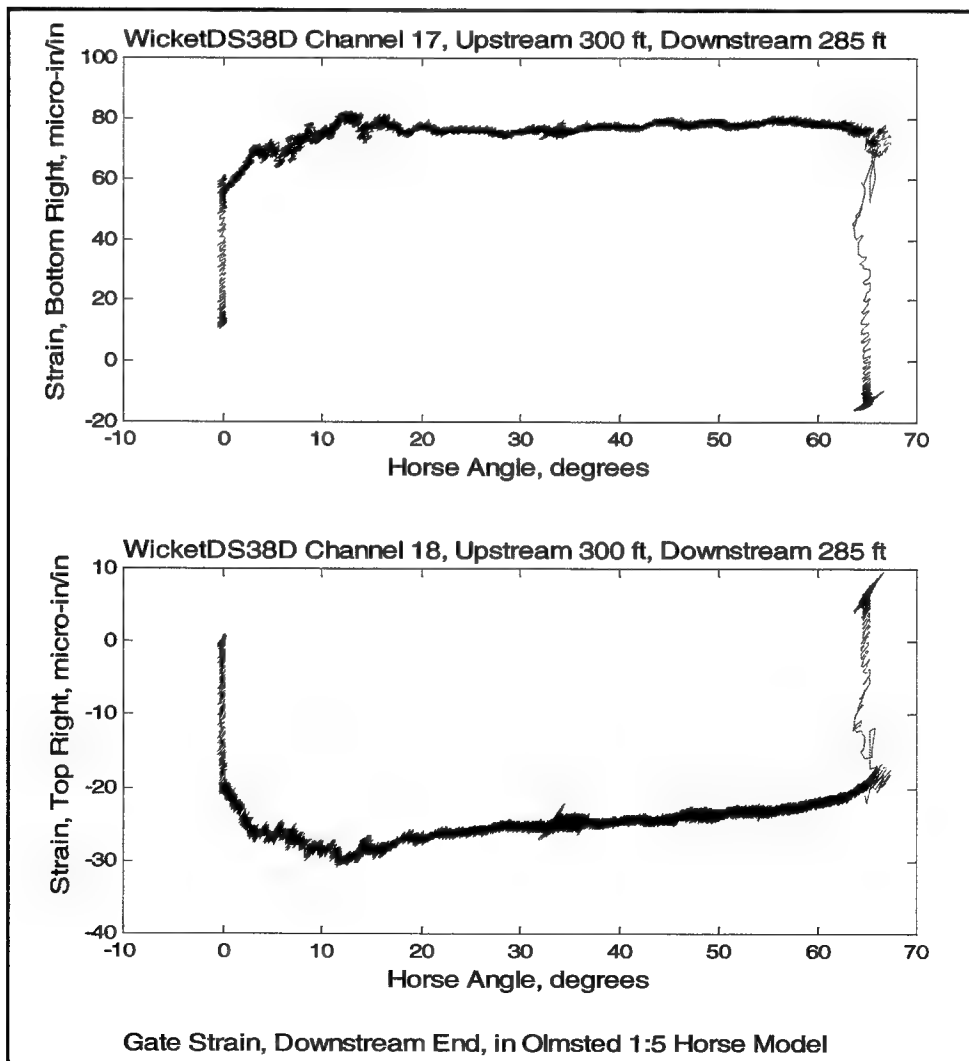


Figure 46. Gate strain, downstream end, top-lifted, 2-gate gap



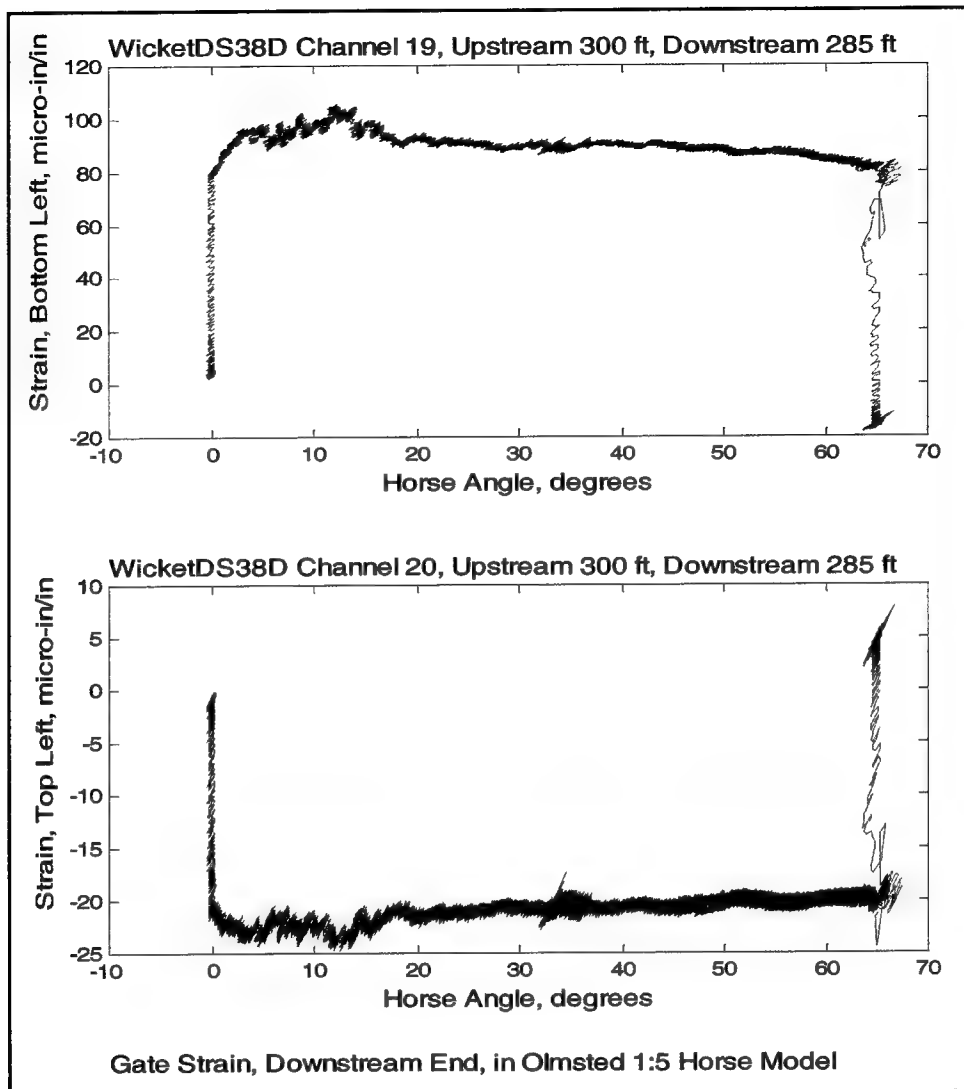


Figure 47. Gate strain, downstream end, top-lifted, 2-gate gap

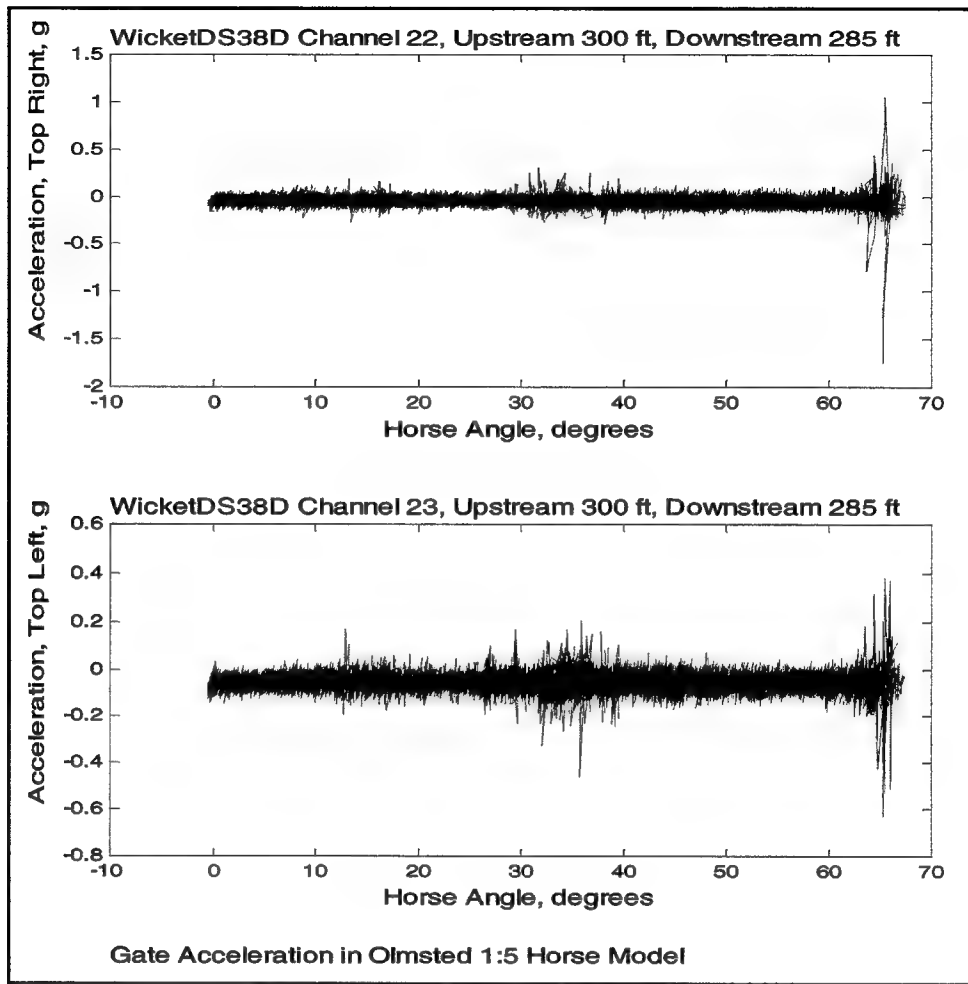


Figure 48. Gate-top acceleration, top-lifted, 2-gate gap

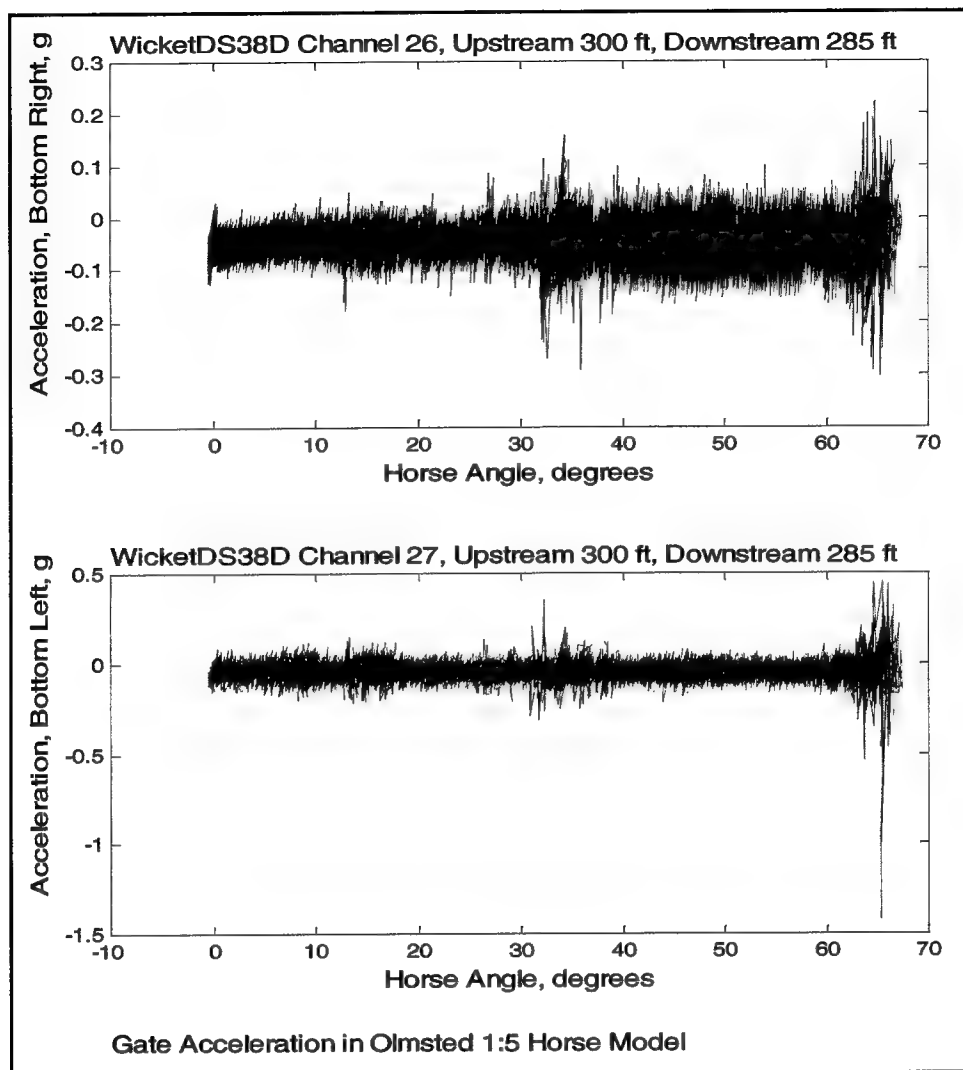


Figure 49. Gate-bottom acceleration, top-lifted, 2-gate gap

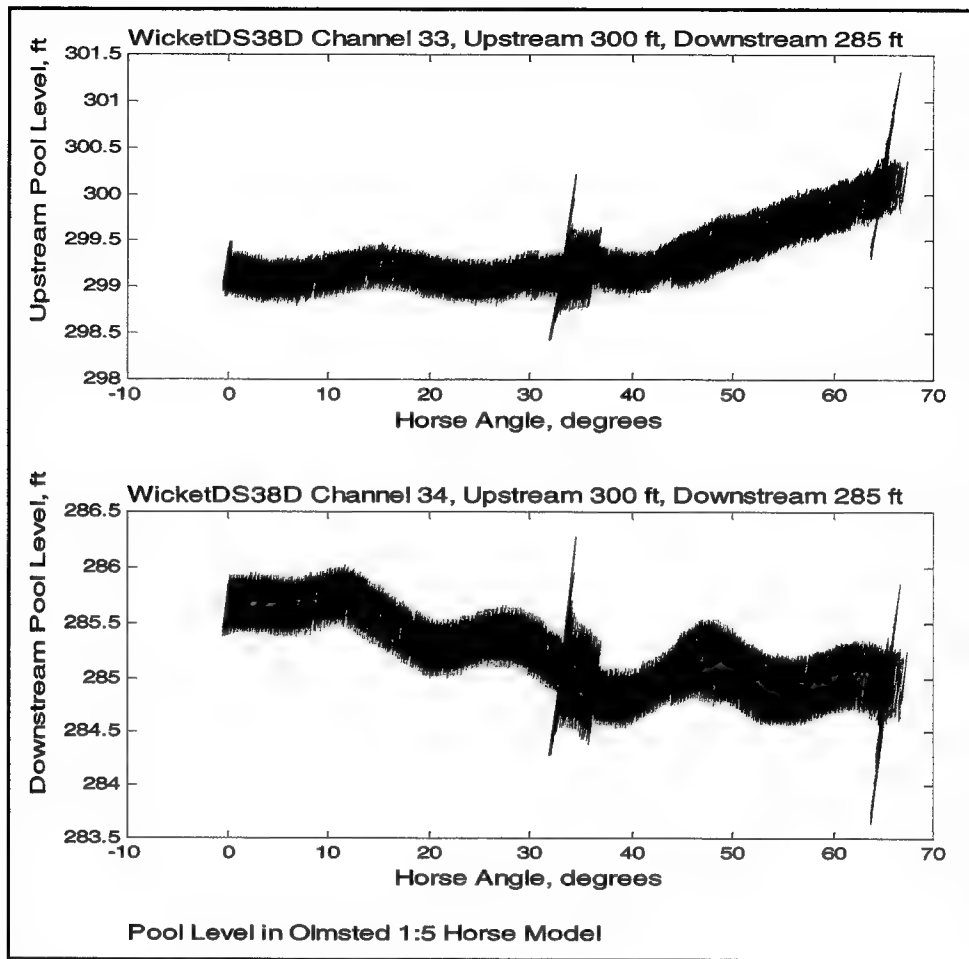


Figure 50. Pool elevations, top-lifted, 2-gate gap

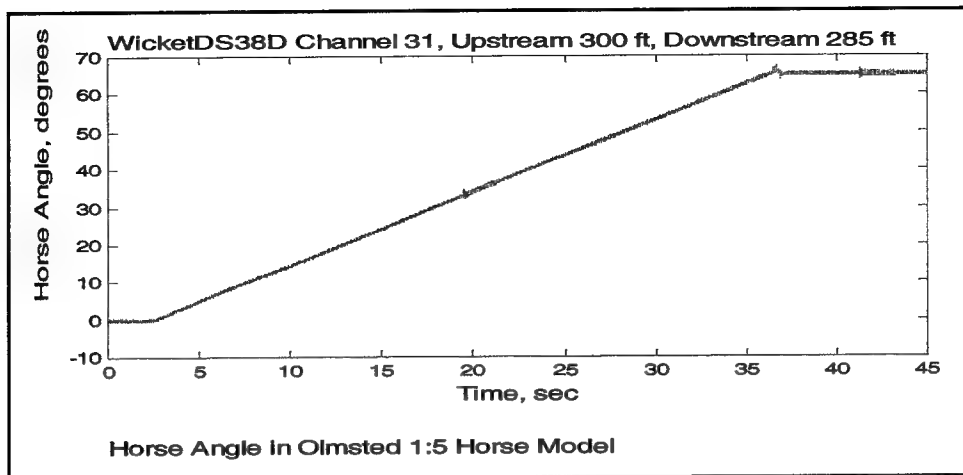


Figure 51. Horse motion as a function of time, top-lifted, 2-gate gap

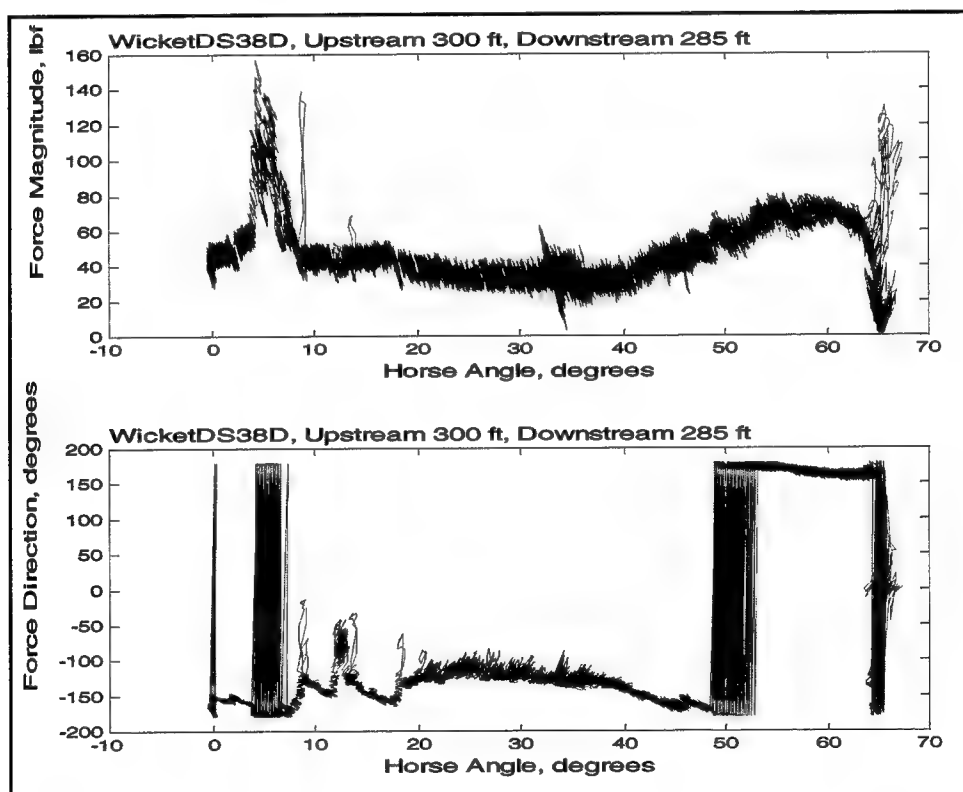


Figure 52. Horse bottom right hinge resultant reaction, top-lifted, 2-gate gap

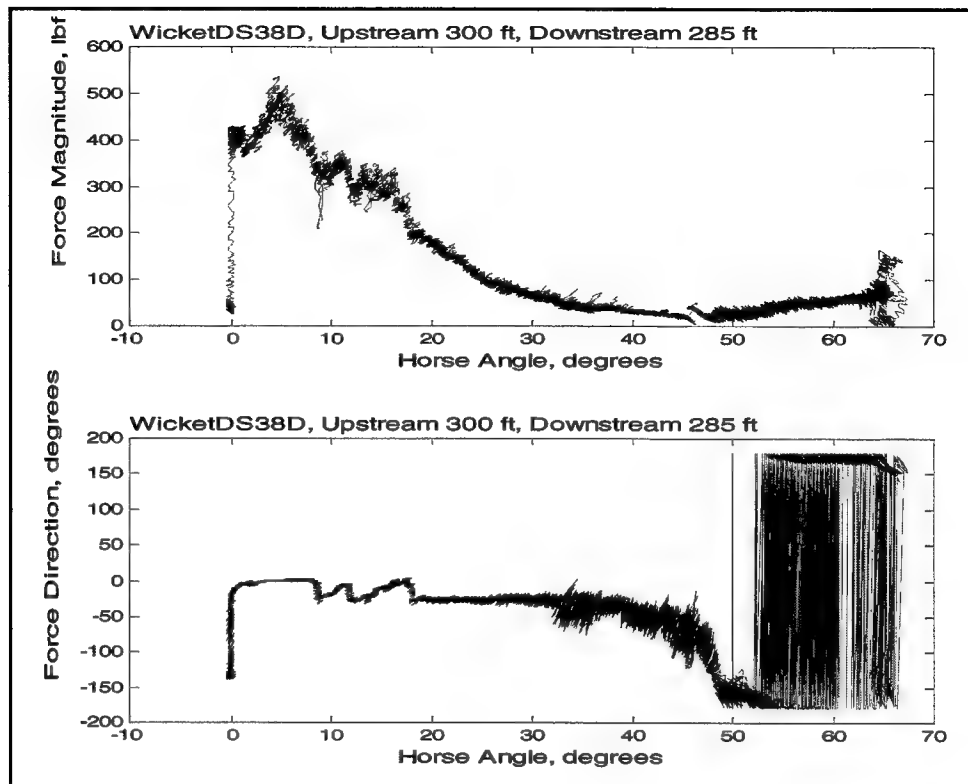


Figure 53. Horse bottom left hinge resultant reaction, top-lifted, 2-gate gap

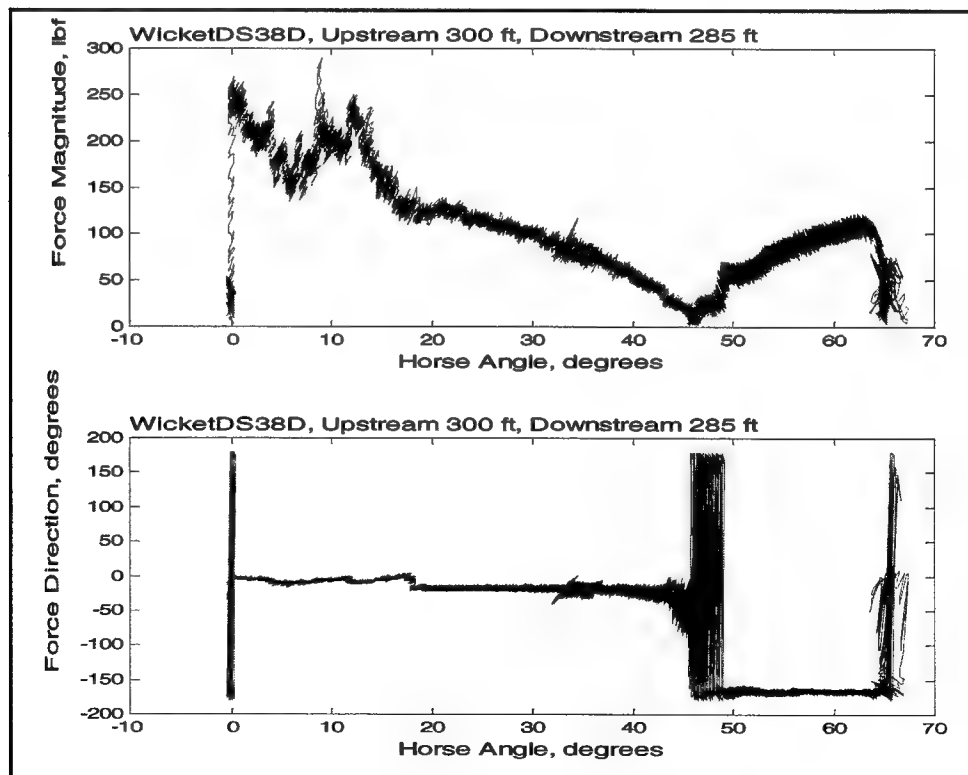


Figure 54. Horse top right hinge resultant reaction, top-lifted, 2-gate gap

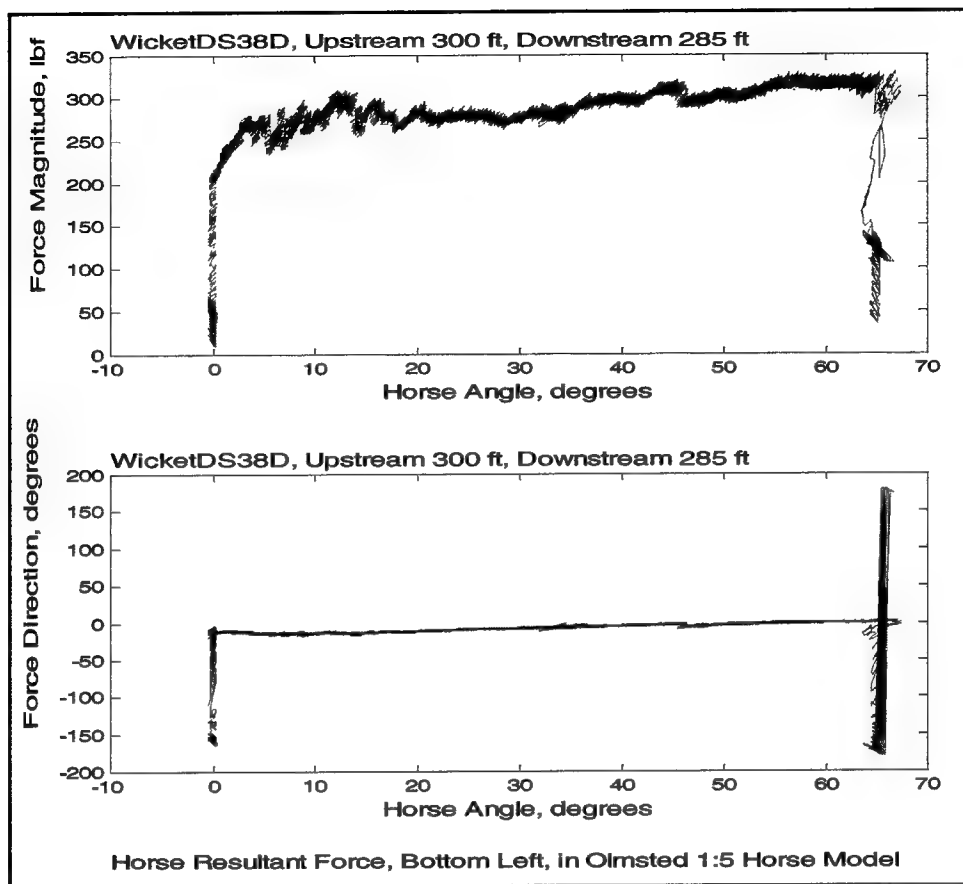


Figure 55. Horse top left hinge resultant reaction, top-lifted, 2-gate gap

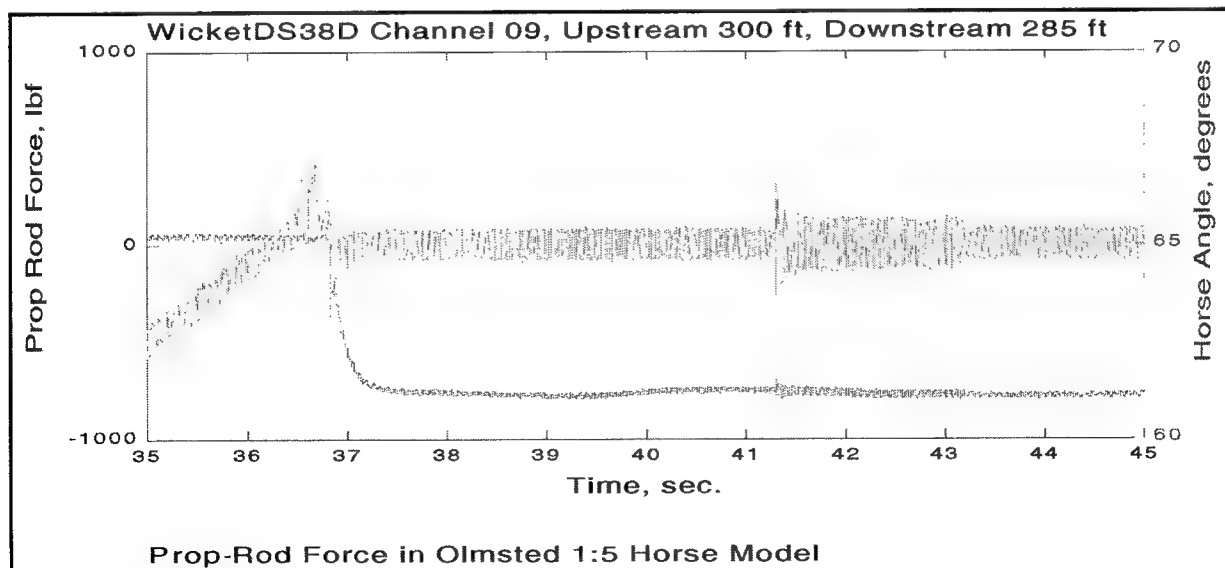


Figure 56. Variation of prop-rod reaction as it is positioned on the hurter, top-lifted, 2-gate gap

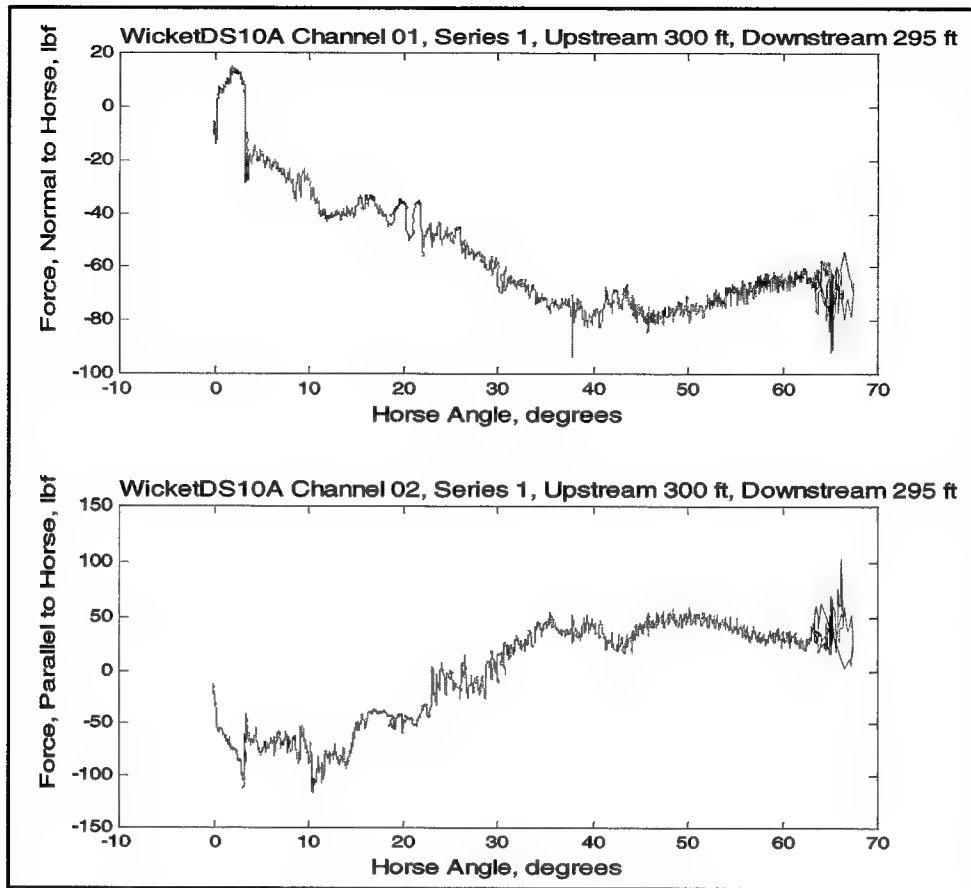


Figure 57. Horse bottom right hinge reactions – bottom-lifted, 2-gate gap



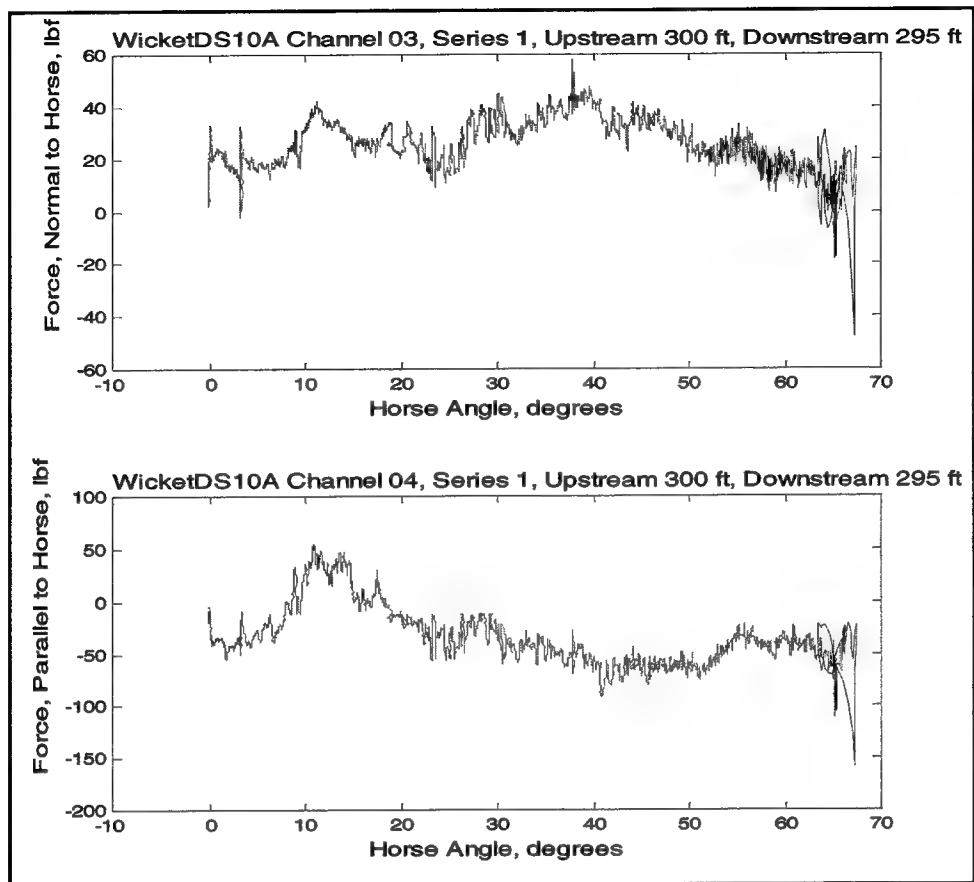


Figure 58. Horse bottom left hinge reactions – bottom-lifted, 2-gate gap

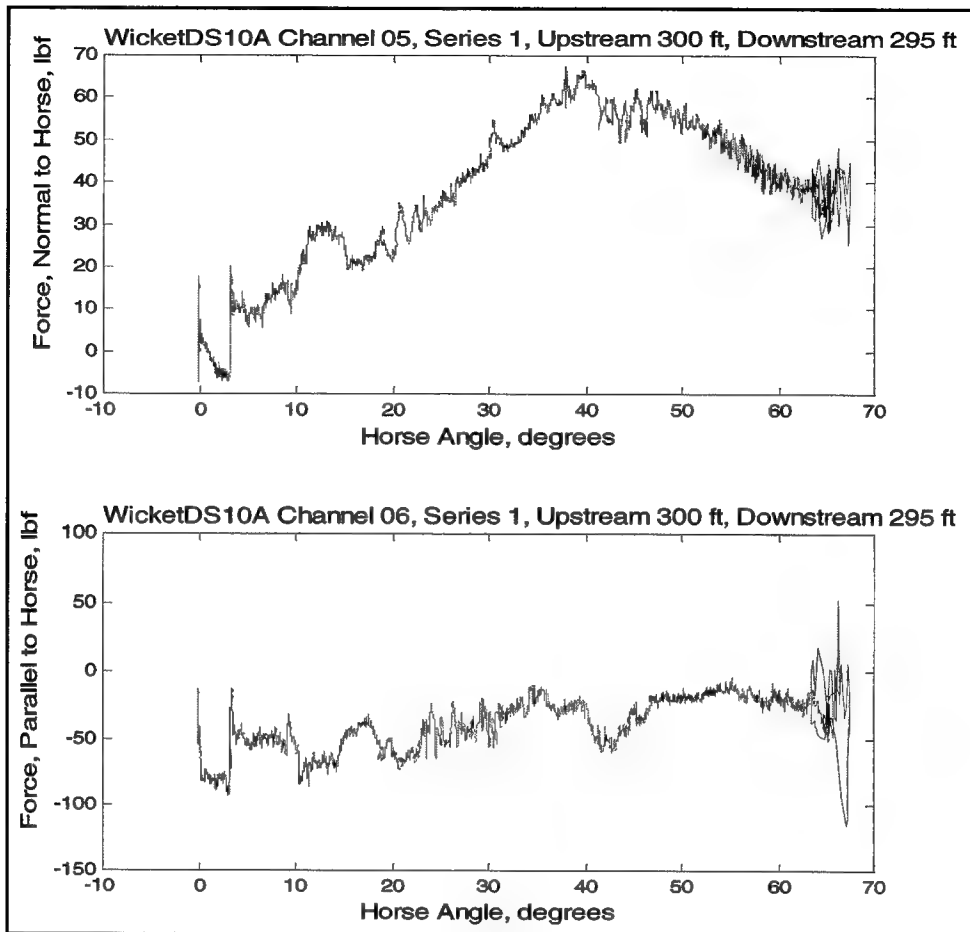


Figure 59. Horse top right hinge reactions – bottom-lifted, 2-gate gap

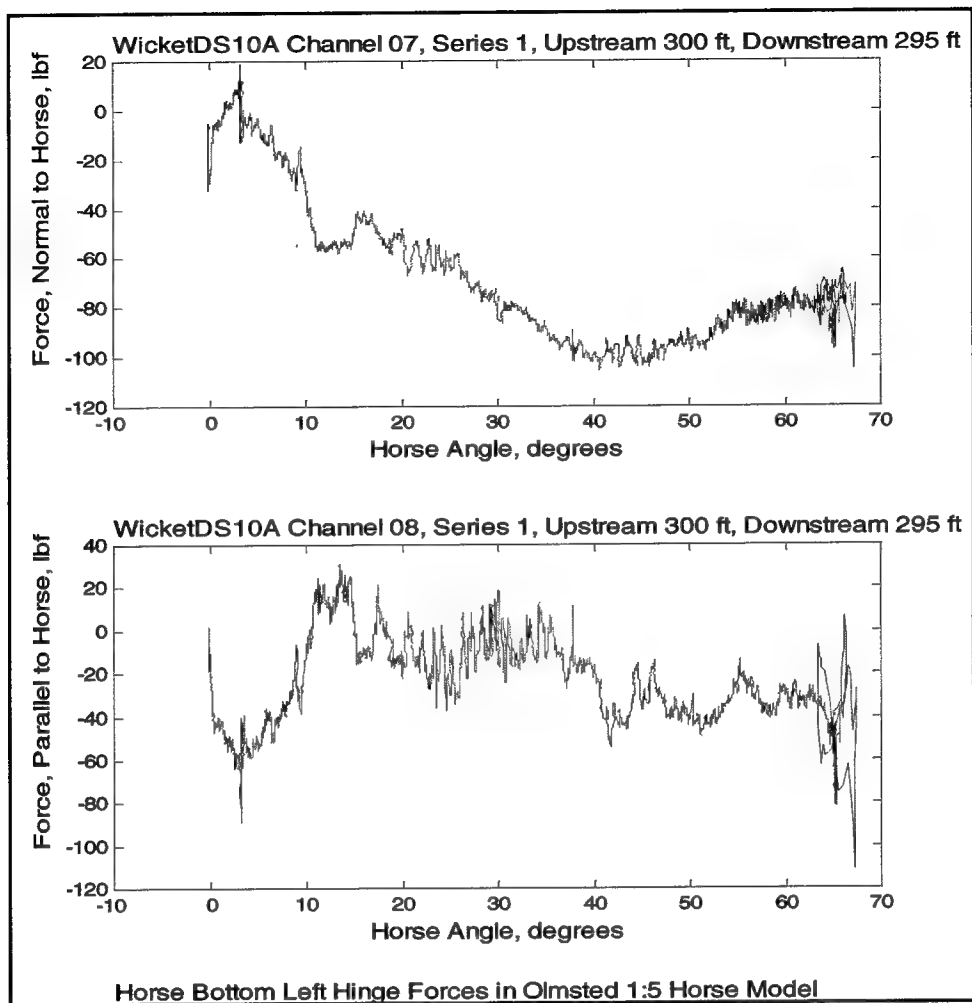


Figure 60. Horse top left hinge reactions – bottom-lifted, 2-gate gap

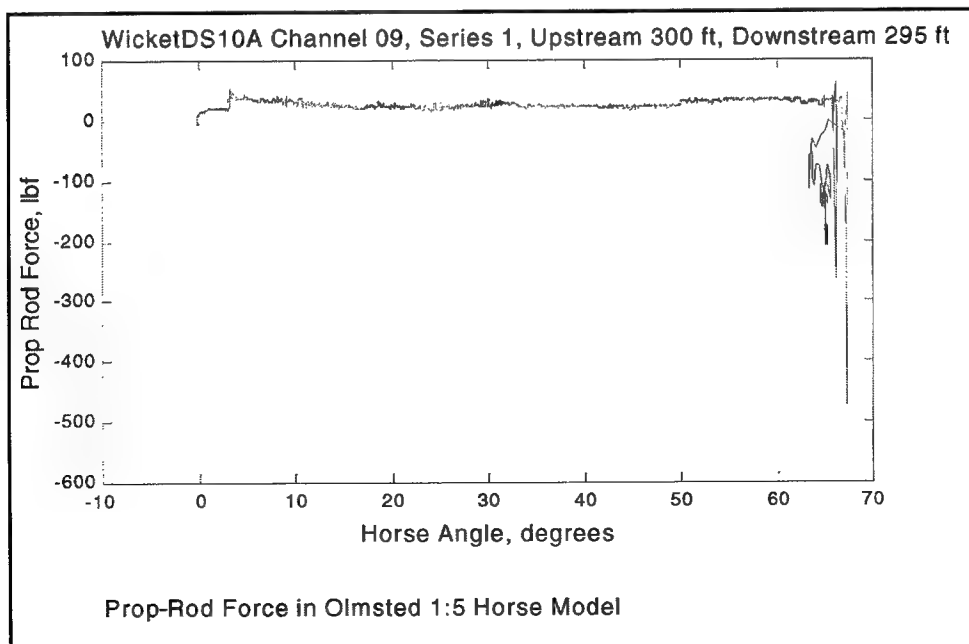


Figure 61. Prop-rod reaction – bottom-lifted, 2-gate gap

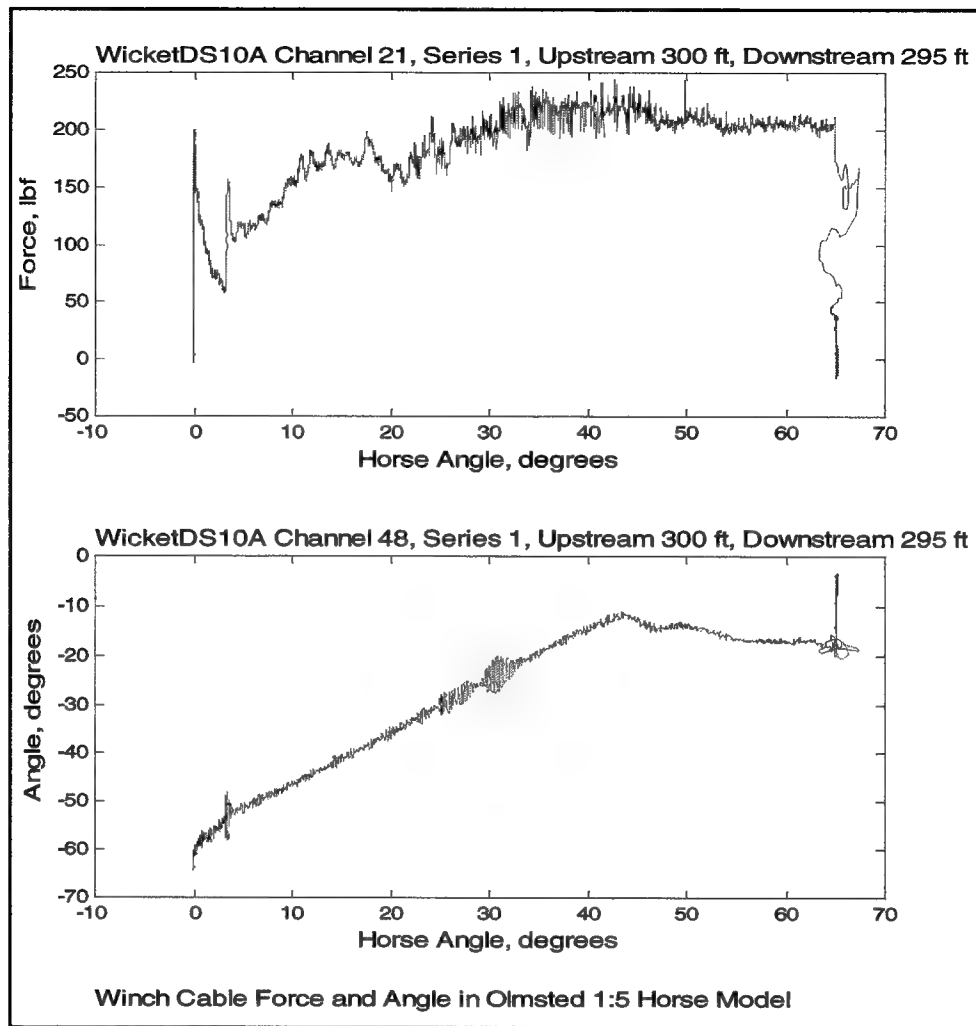


Figure 62. Winch cable measurements – bottom-lifted, 2-gate gap

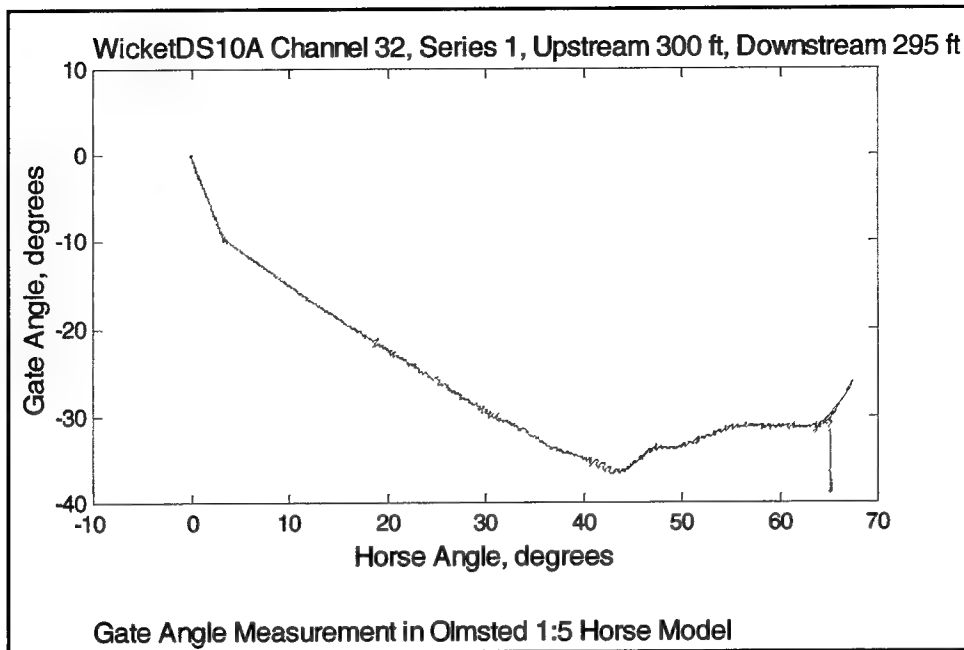


Figure 63. Gate angle as a function of horse angle – bottom-lifted, 2-gate gap

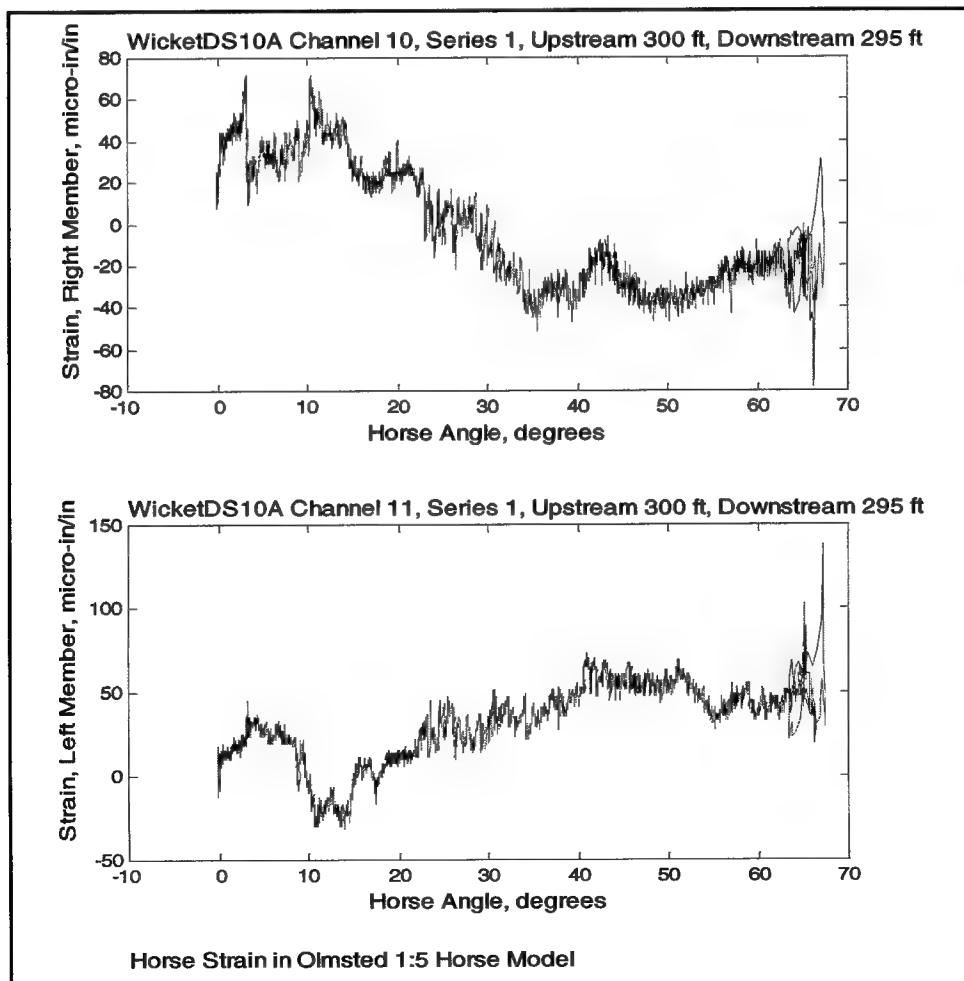


Figure 64. Horse strain, parallel bars – bottom-lifted, 2-gate gap

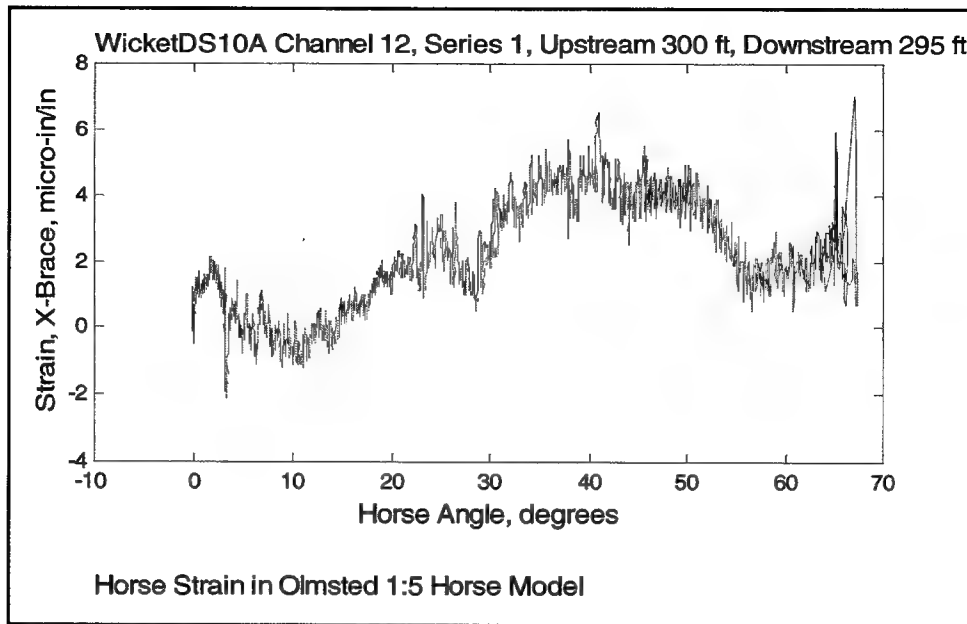


Figure 65. Horse strain, cross-bracing – bottom-lifted, 2-gate gap

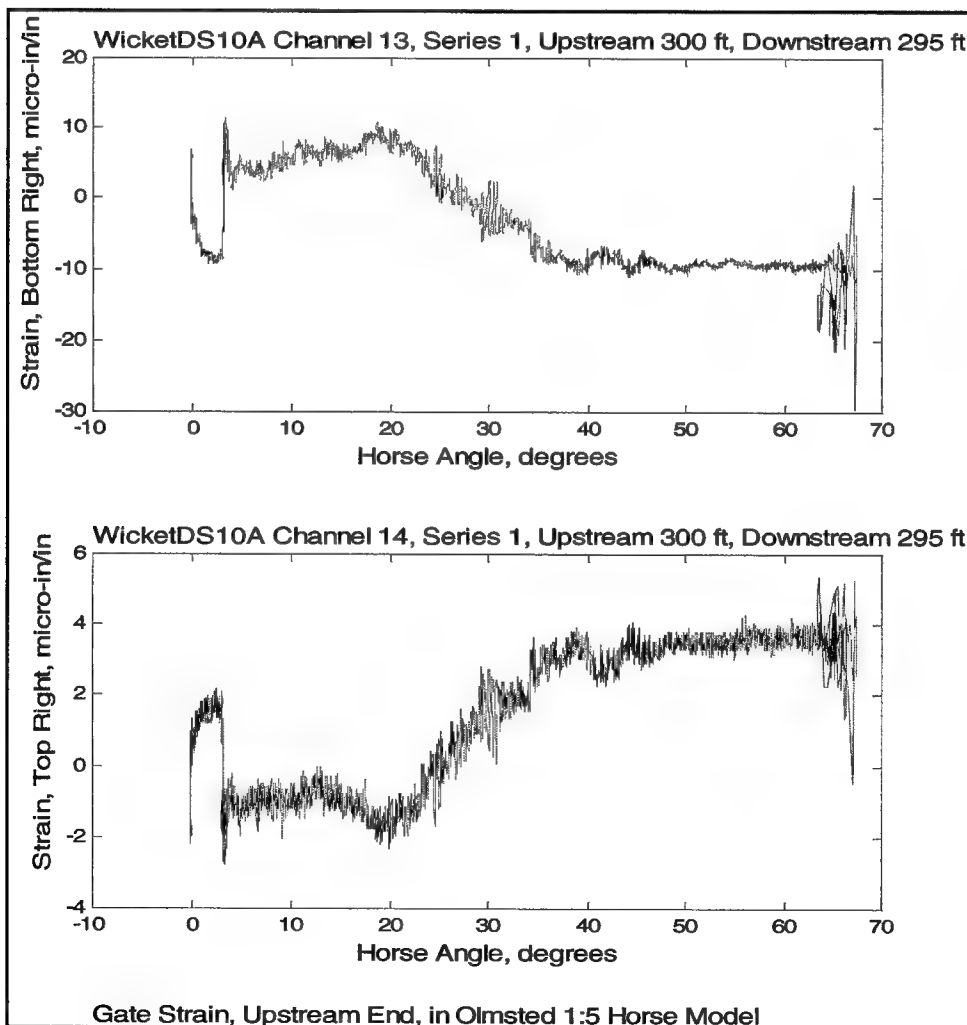


Figure 66. Gate strain at upstream end – bottom-lifted, 2-gate gap

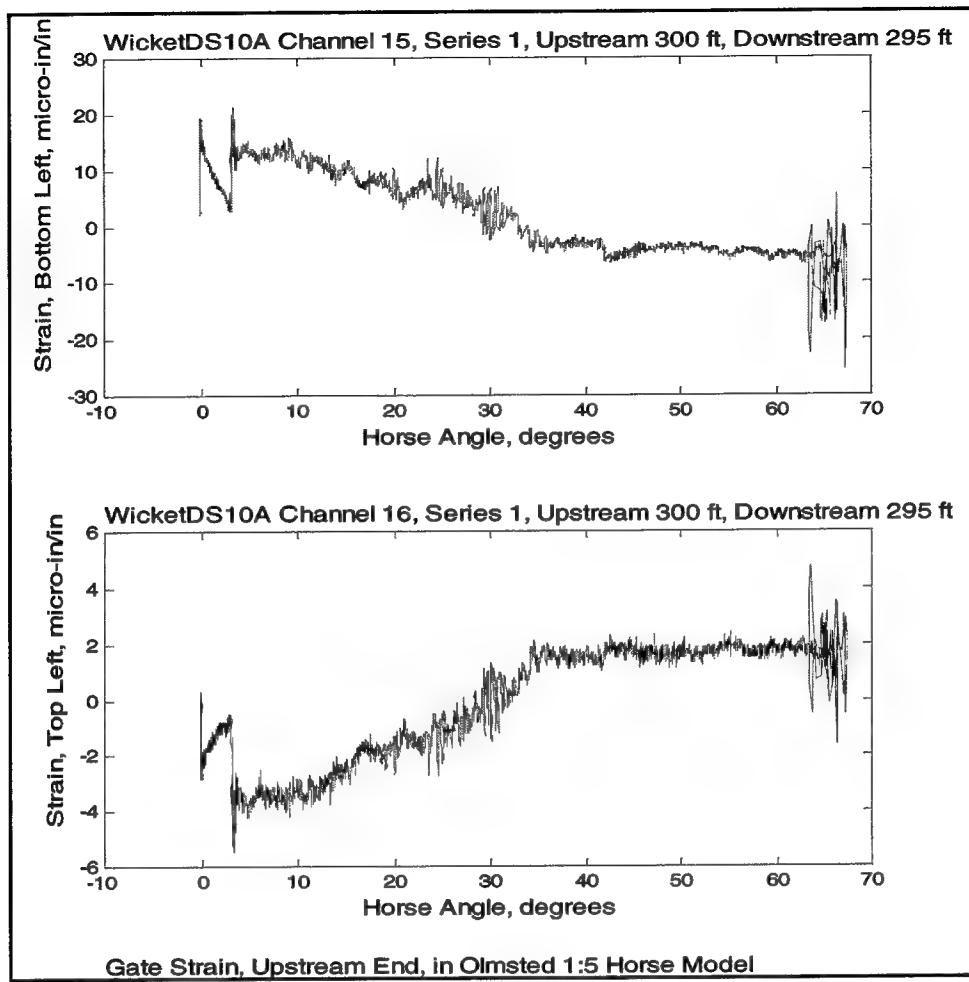


Figure 67. Gate strain, upstream end – bottom-lifted, 2-gate gap

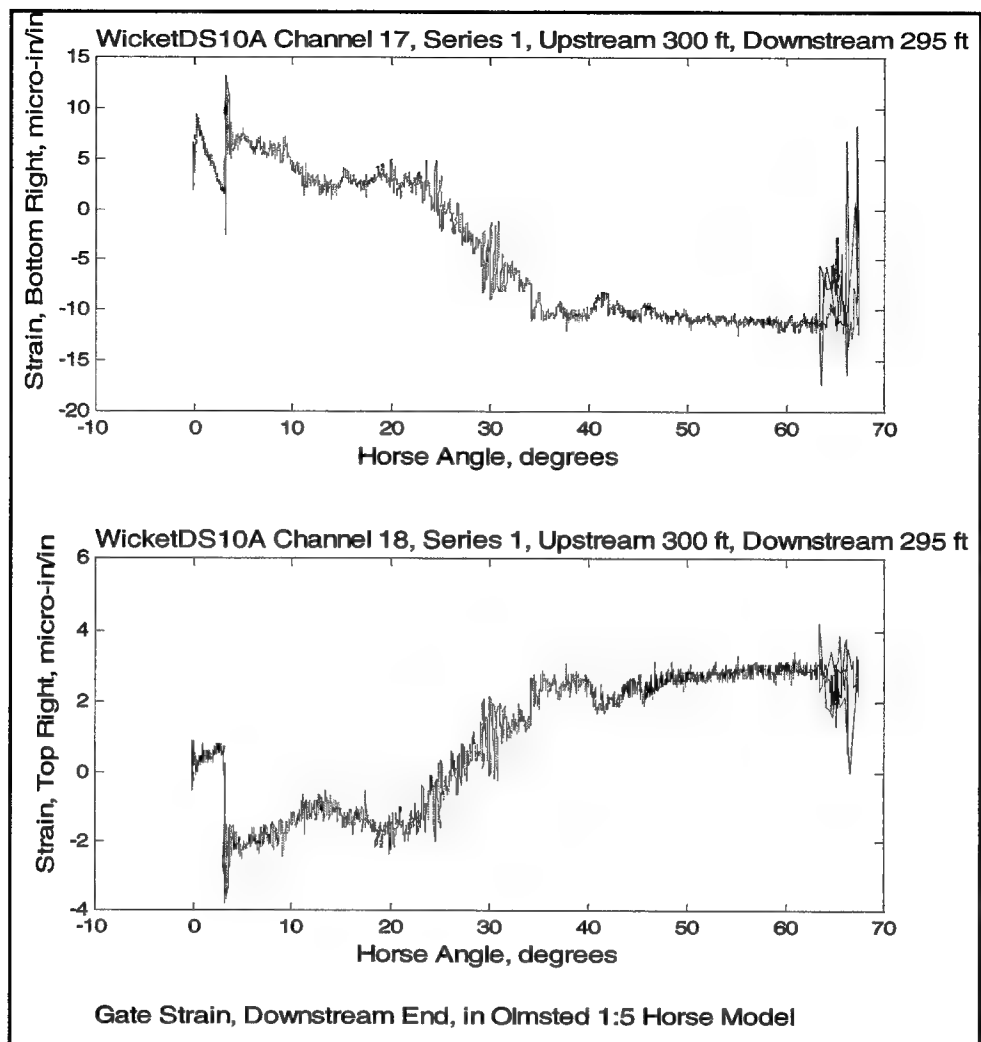


Figure 68. Gate strain, downstream end – bottom-lifted, 2-gate gap



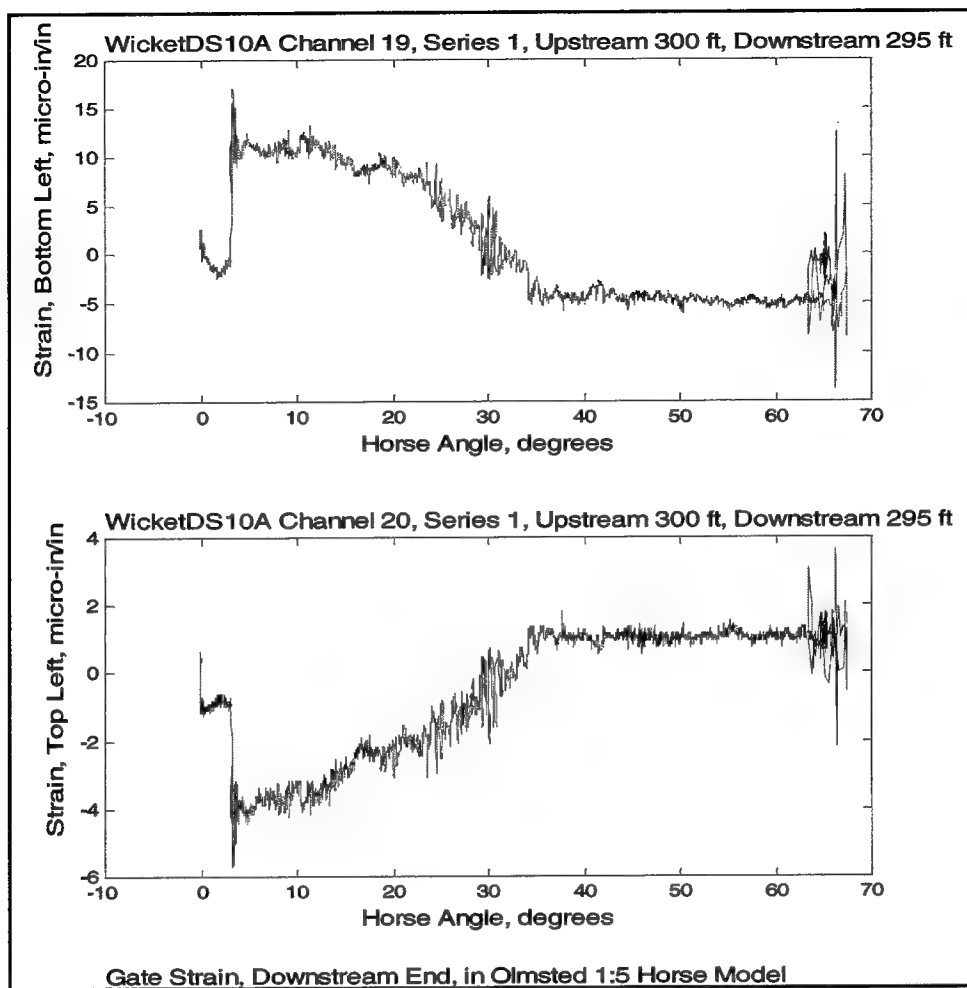


Figure 69. Gate strain, downstream end – bottom-lifted, 2-gate gap

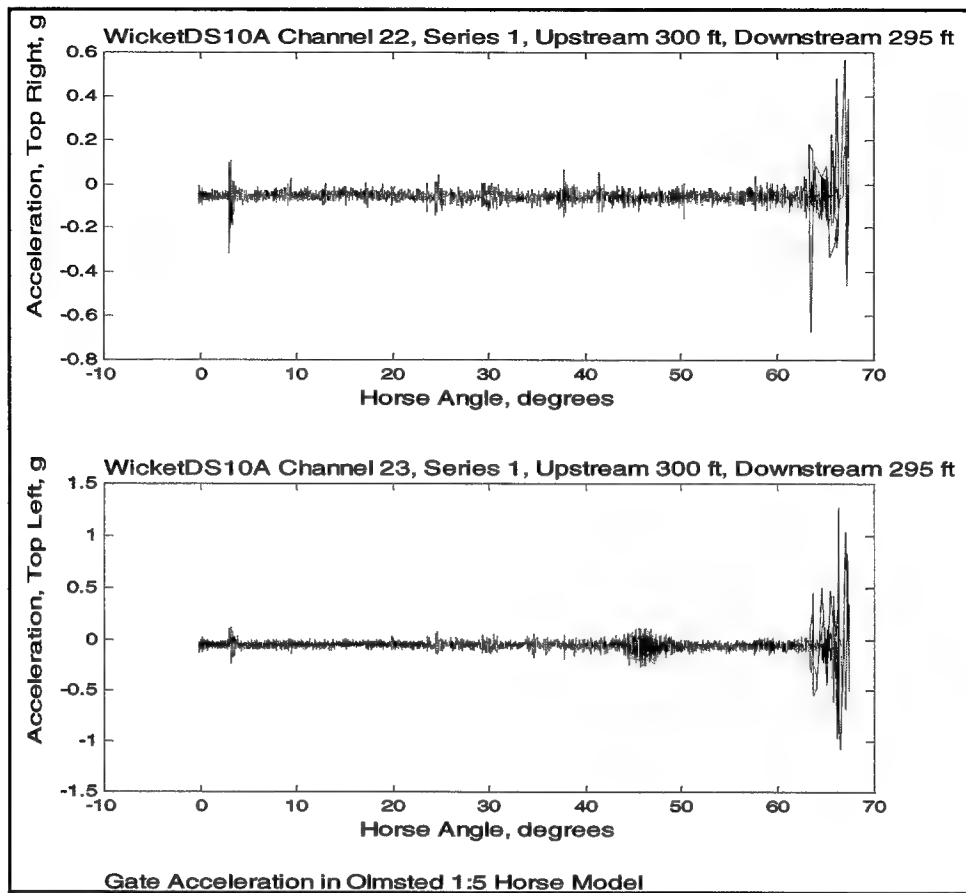


Figure 70. Gate acceleration – bottom-lifted, 2-gate gap

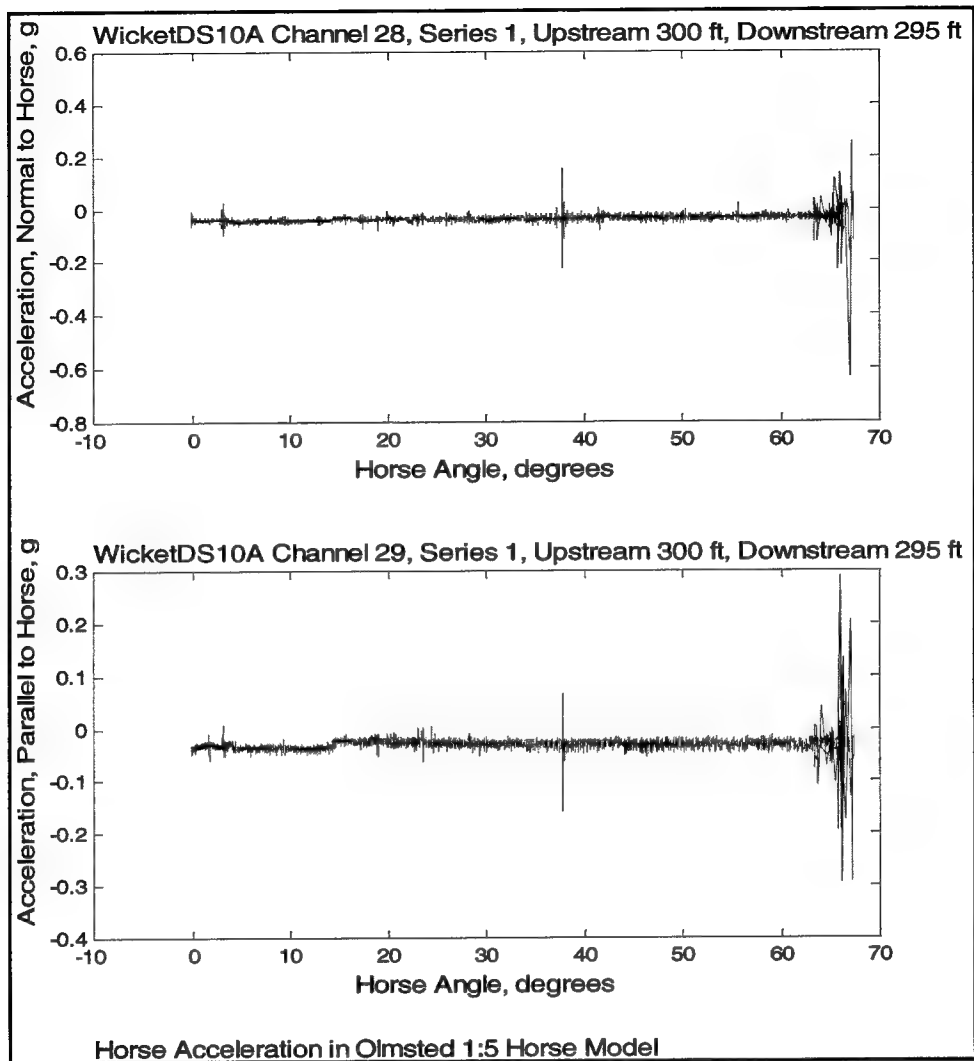


Figure 71. Horse acceleration – bottom-lifted, 2-gate gap

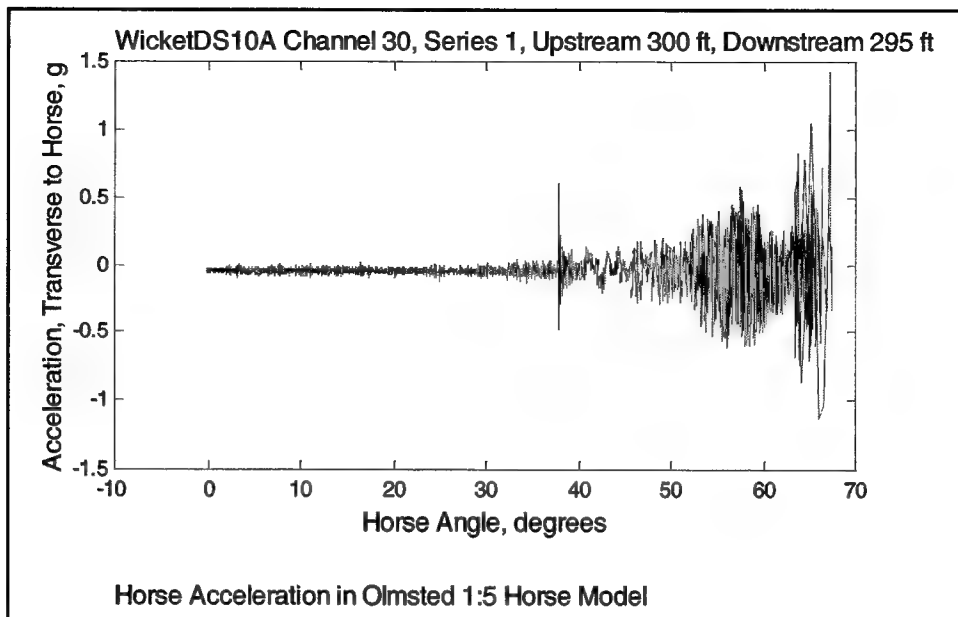


Figure 72. Horse acceleration, transverse direction – bottom-lifted, 2-gate gap

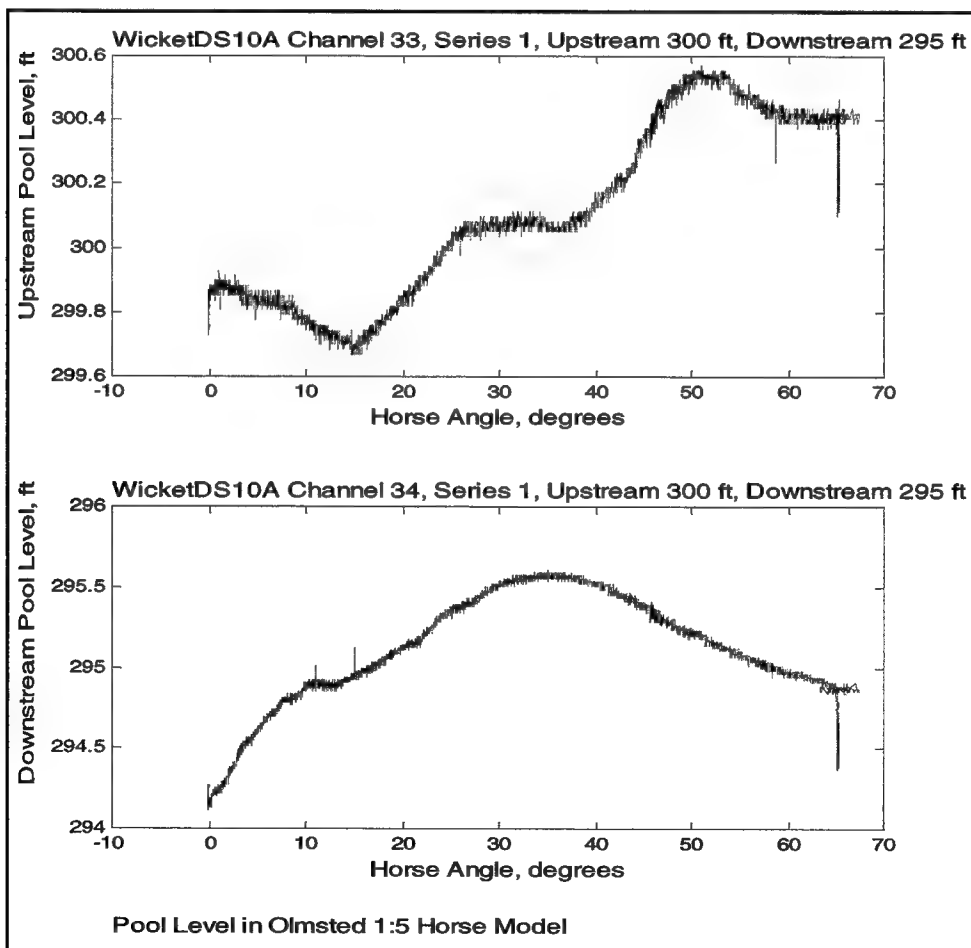


Figure 73. Pool elevations – bottom-lifted, 2-gate gap

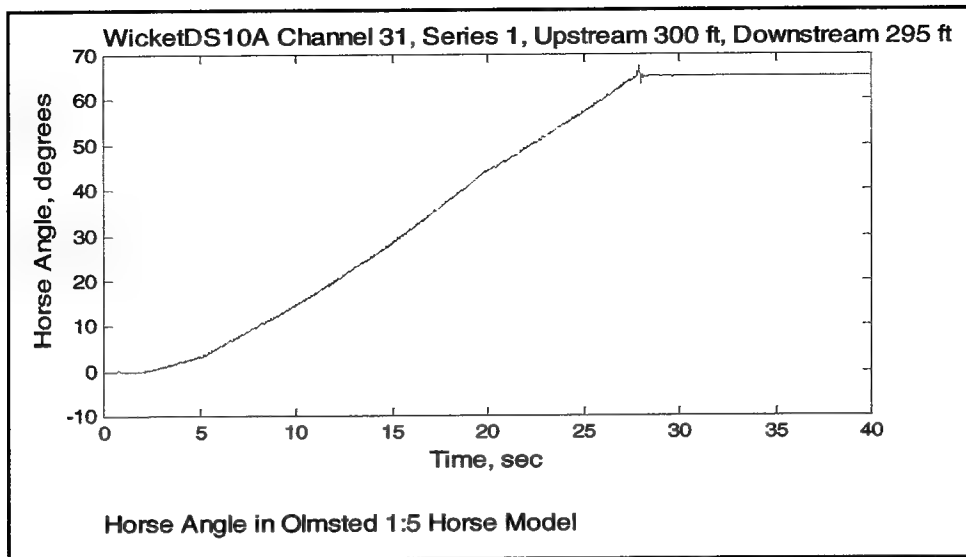


Figure 74. Horse angle as a function of time – bottom-lifted, 2-gate gap

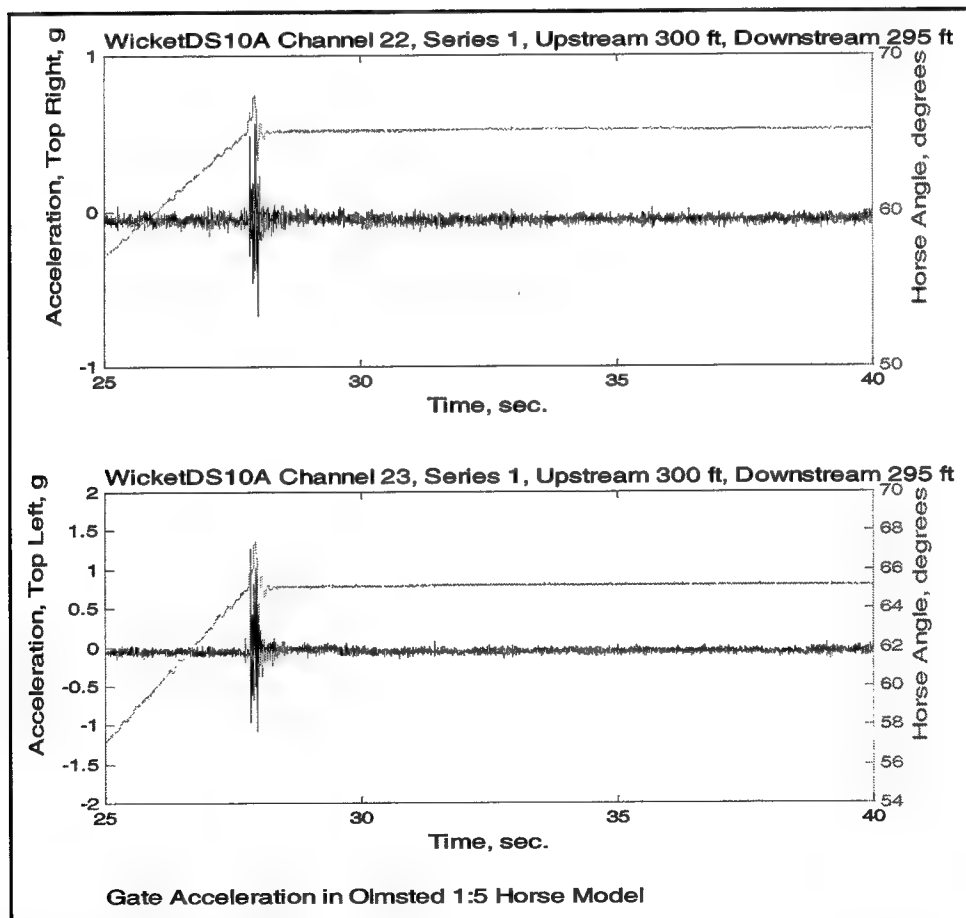


Figure 75. Gate acceleration when the prop rod was positioned on the hurter – bottom-lifted, 2-gate gap

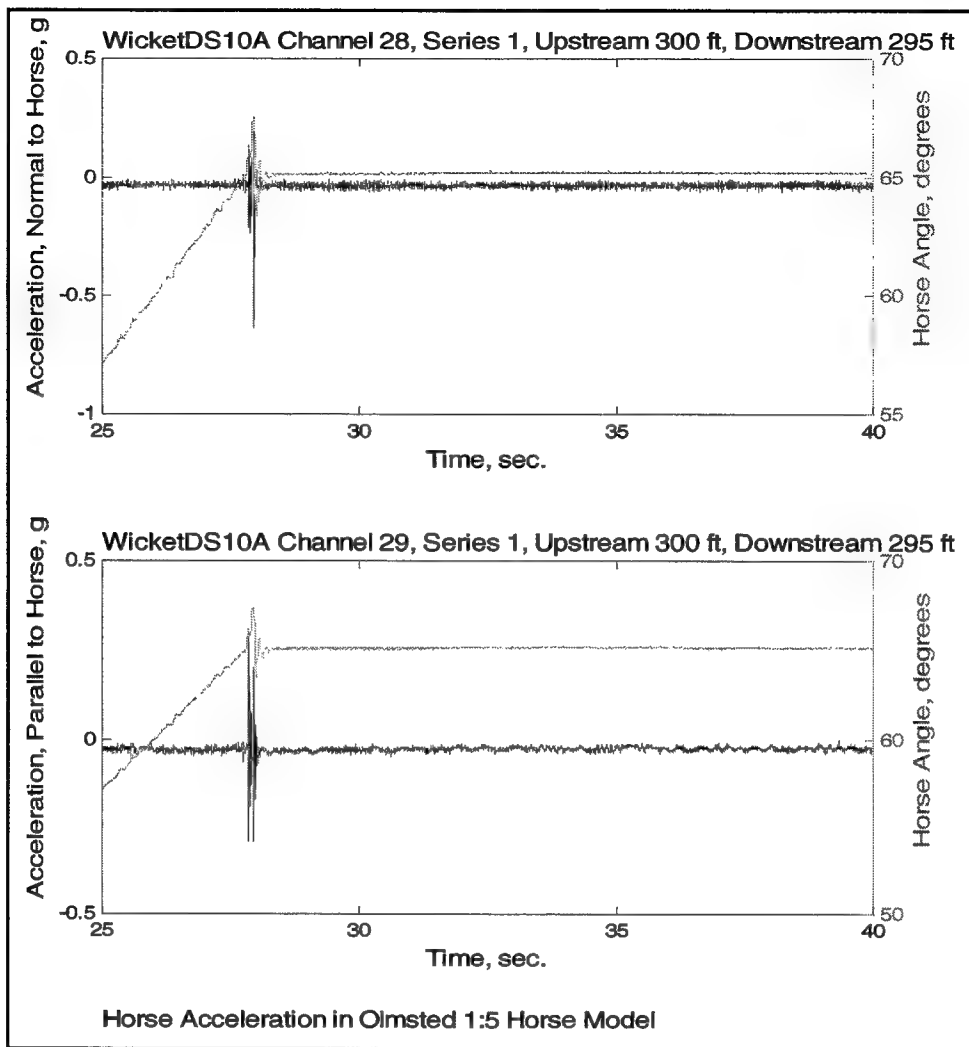


Figure 76. Horse acceleration when the prop rod was positioned on the hurter – bottom-lifted, 2-gate gap

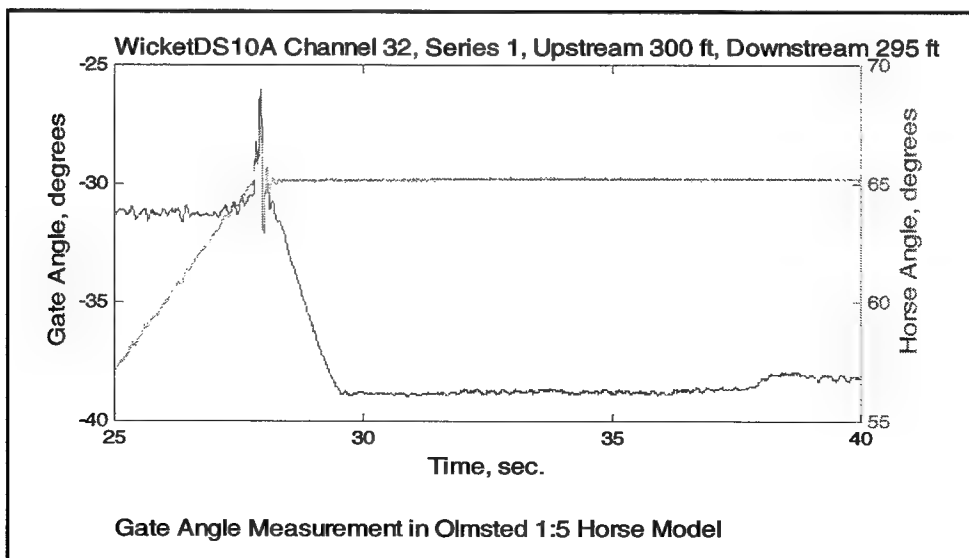


Figure 77. Gate angle variation at the end of lifting cycle – bottom-lifted, 2-gate gap

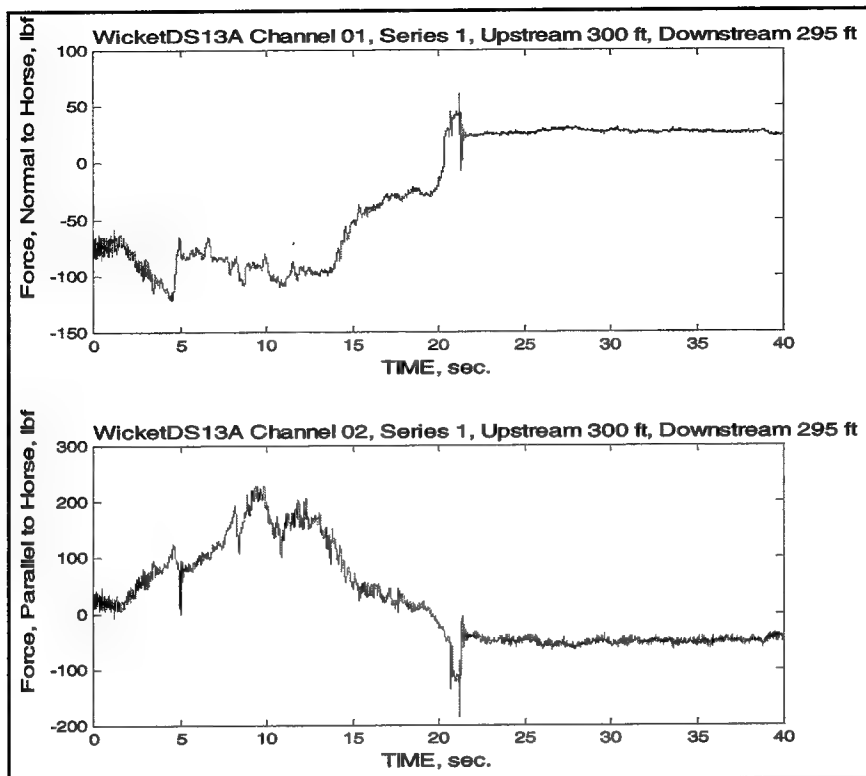


Figure 78. Horse bottom right hinge reactions – bottom-lift drop test, 2-gate gap

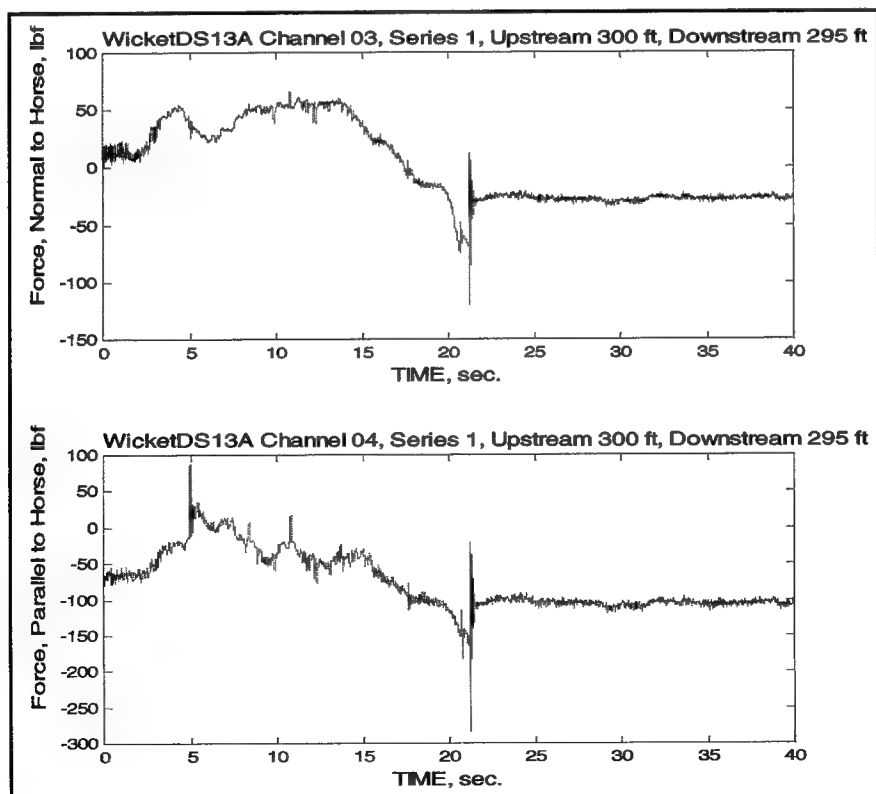


Figure 79. Horse bottom left hinge reactions – bottom-lift drop test, 2-gate gap

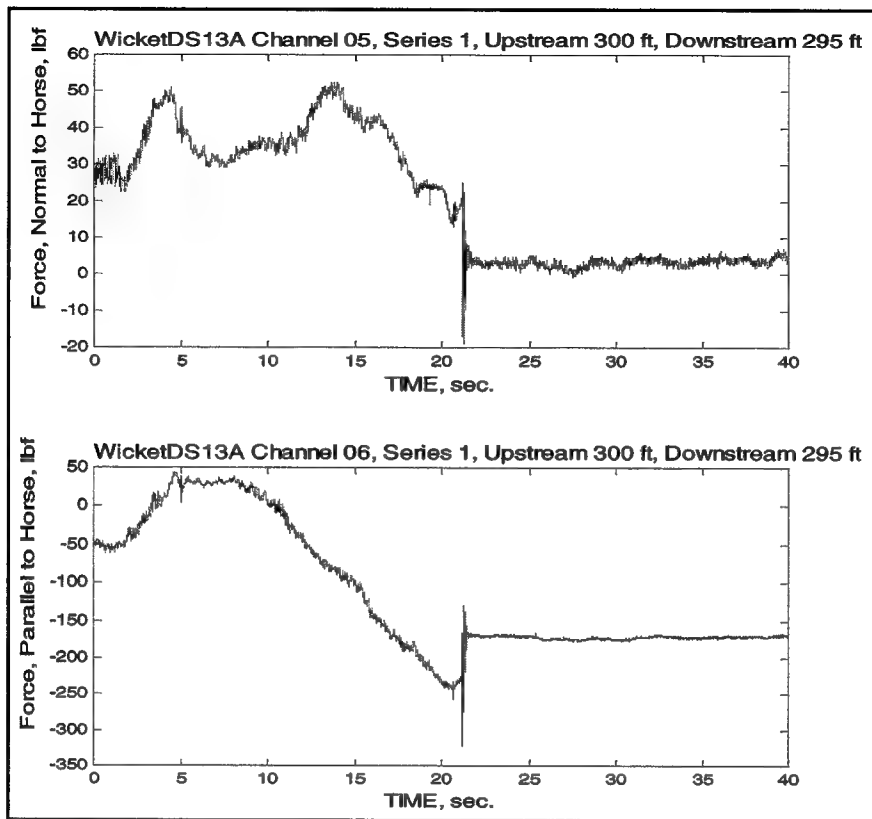


Figure 80. Horse top right hinge reactions – bottom-lift drop test, 2-gate gap

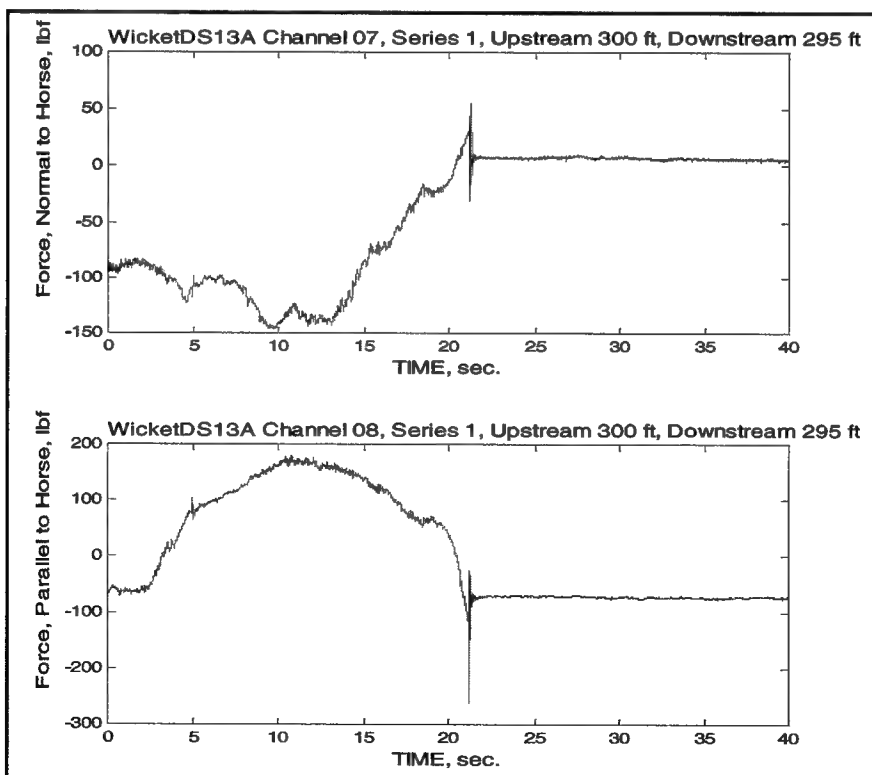


Figure 81. Horse top left hinge reactions – bottom-lift drop test, 2-gate gap



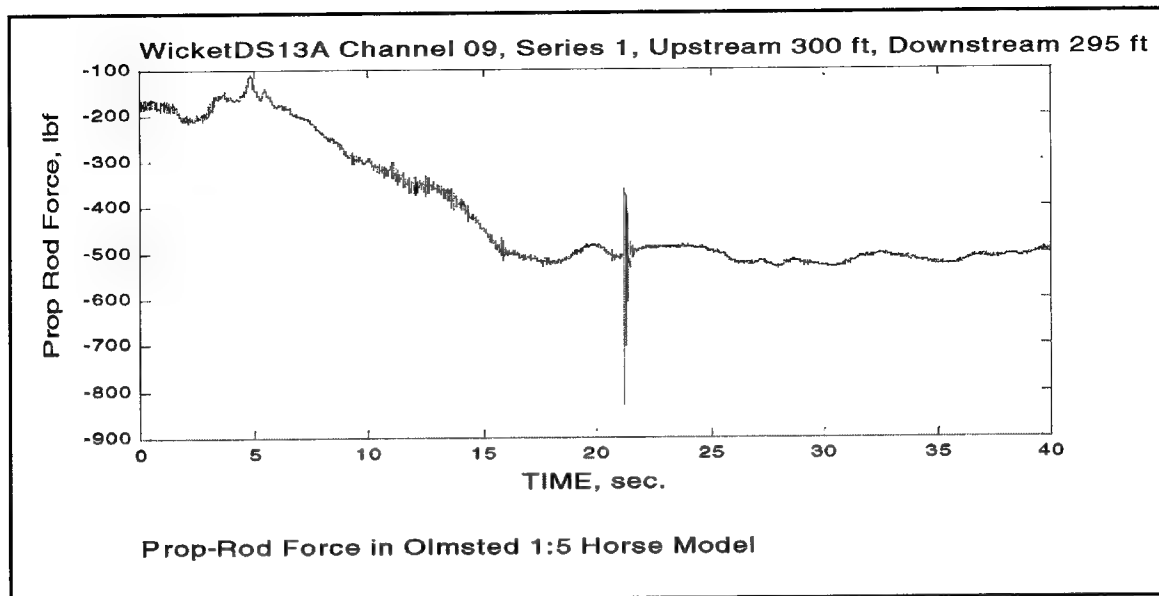


Figure 82. Prop-rod reaction – bottom-lift drop test, 2-gate gap

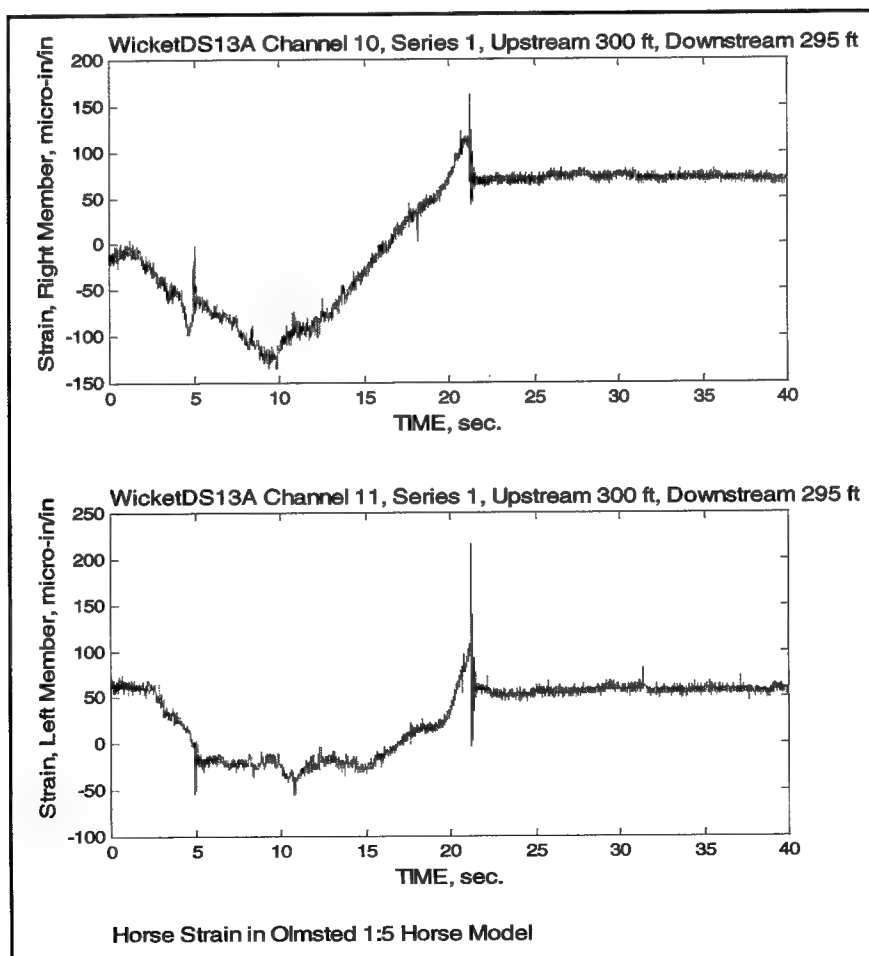


Figure 83. Horse strain, parallel bars – bottom-lift drop test, 2-gate gap

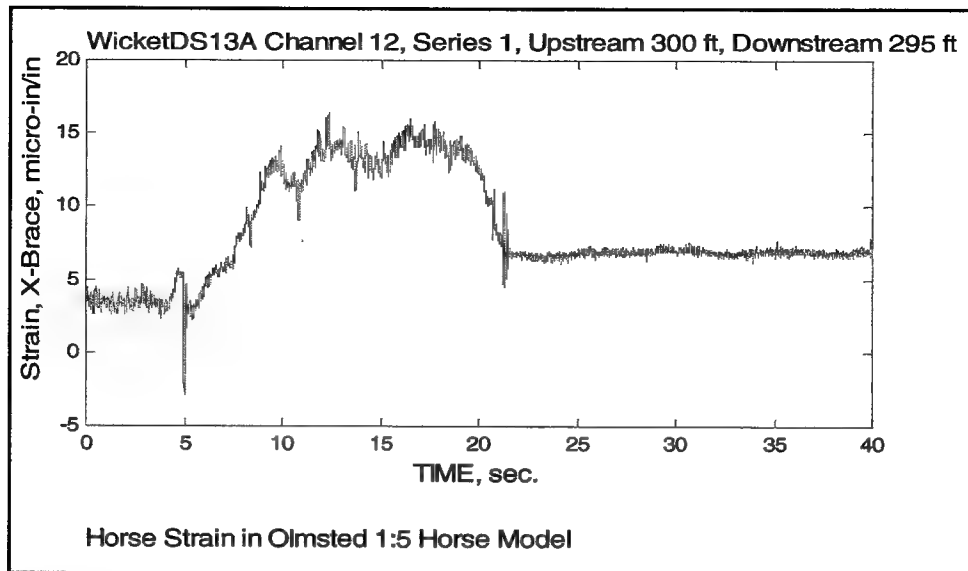


Figure 84. Horse strain, x-bracing – bottom-lift drop test, 2-gate gap

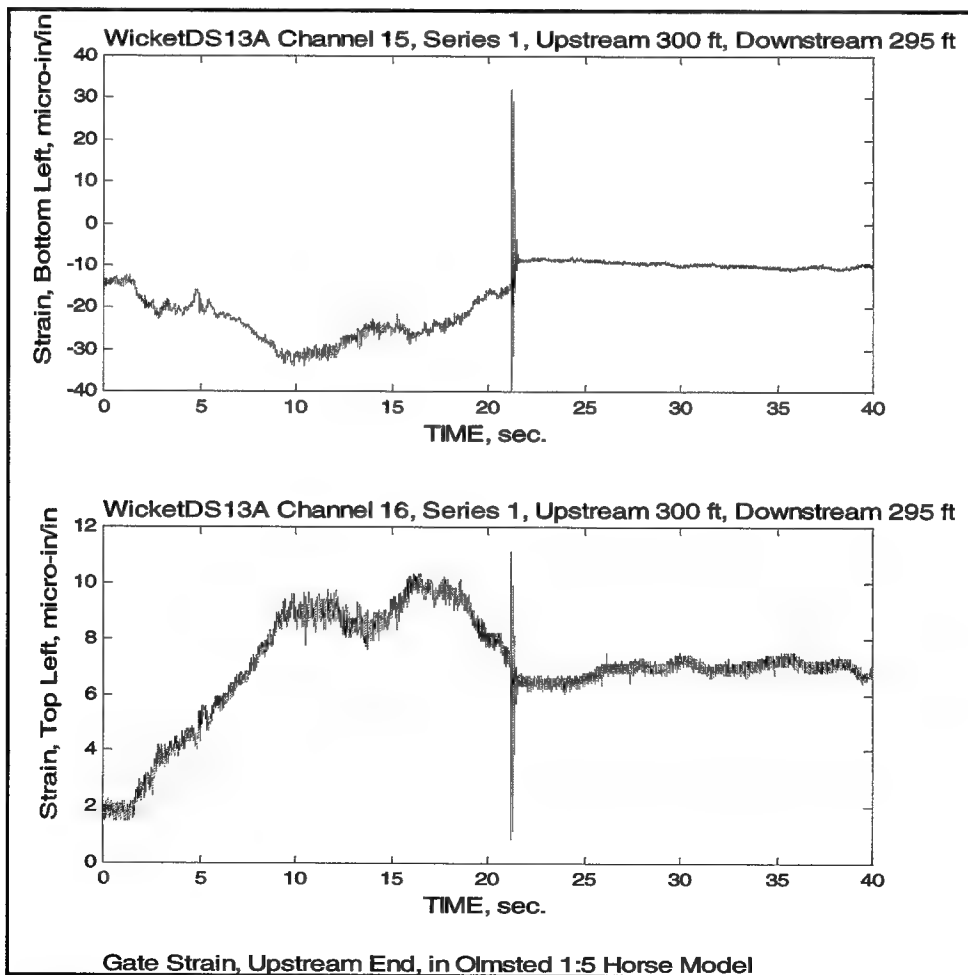


Figure 85. Gate strain, upstream end – bottom-lift drop test, 2-gate gap

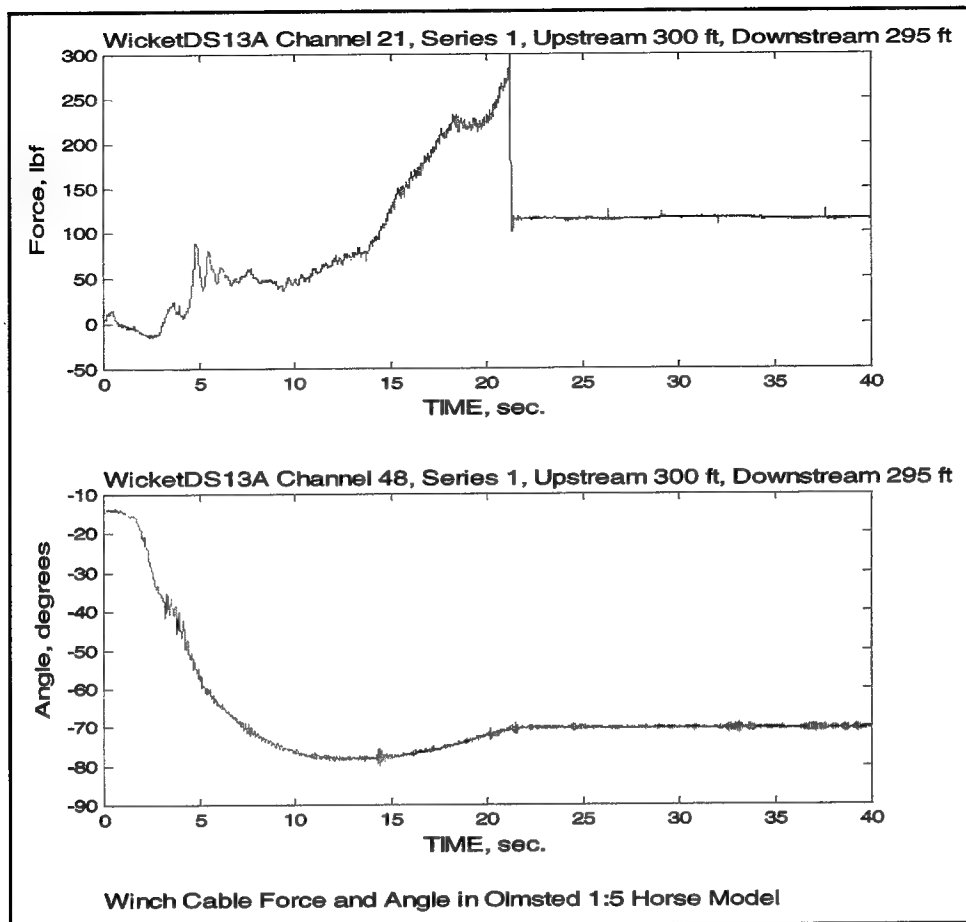


Figure 86. Winch cable measurements – bottom-lift drop test, 2-gate gap

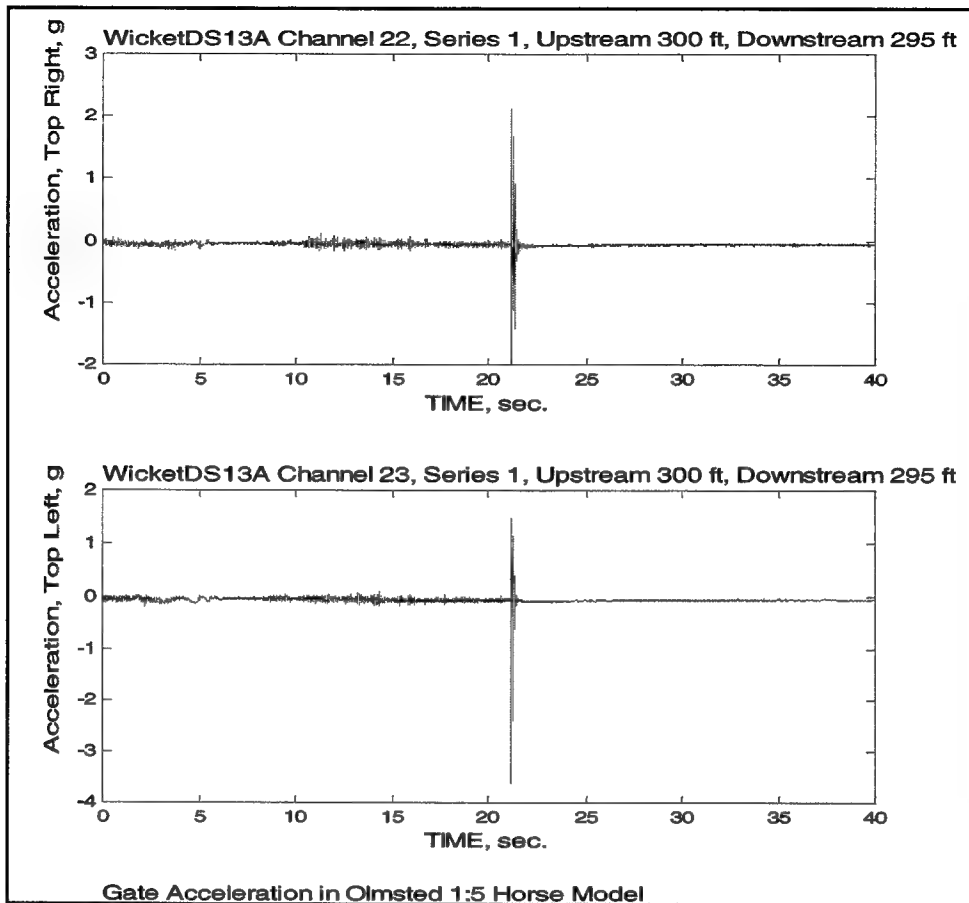


Figure 87. Gate acceleration – bottom-lift drop test, 2-gate gap

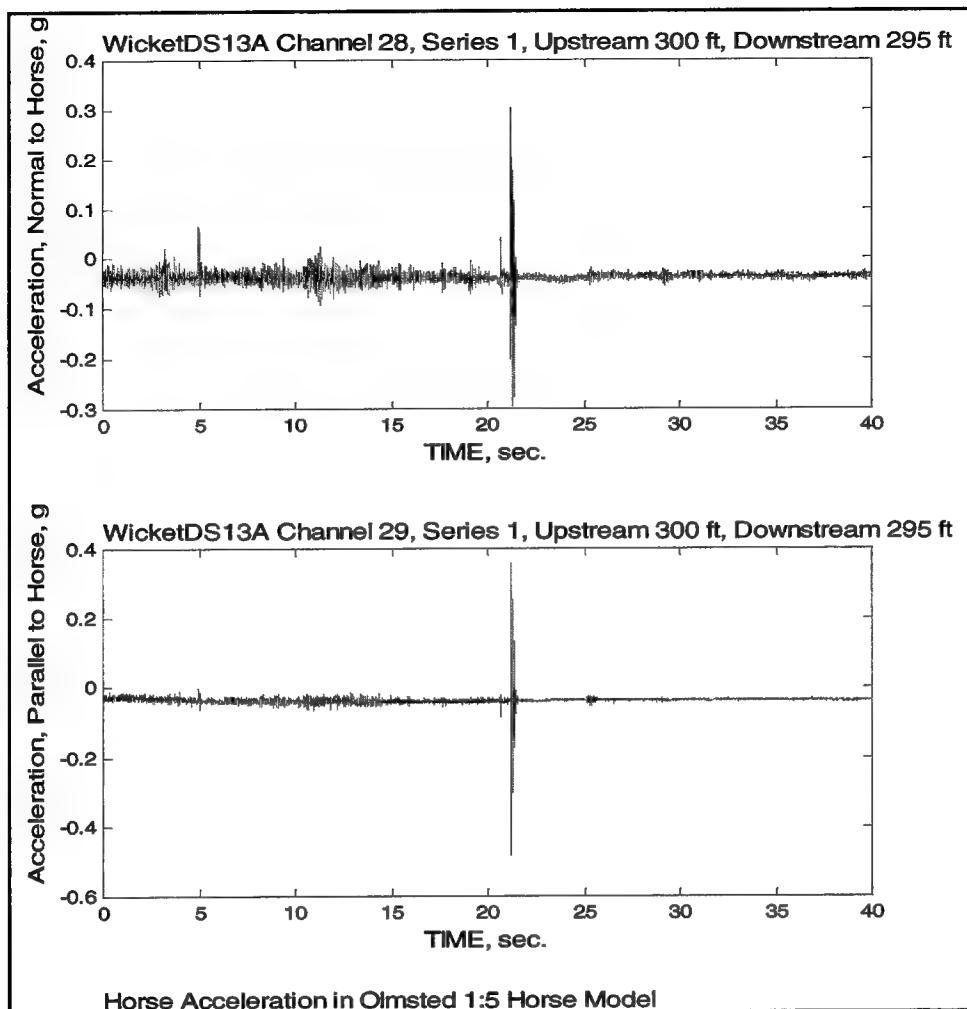


Figure 88. Horse acceleration – bottom-lift drop test, 2-gate gap

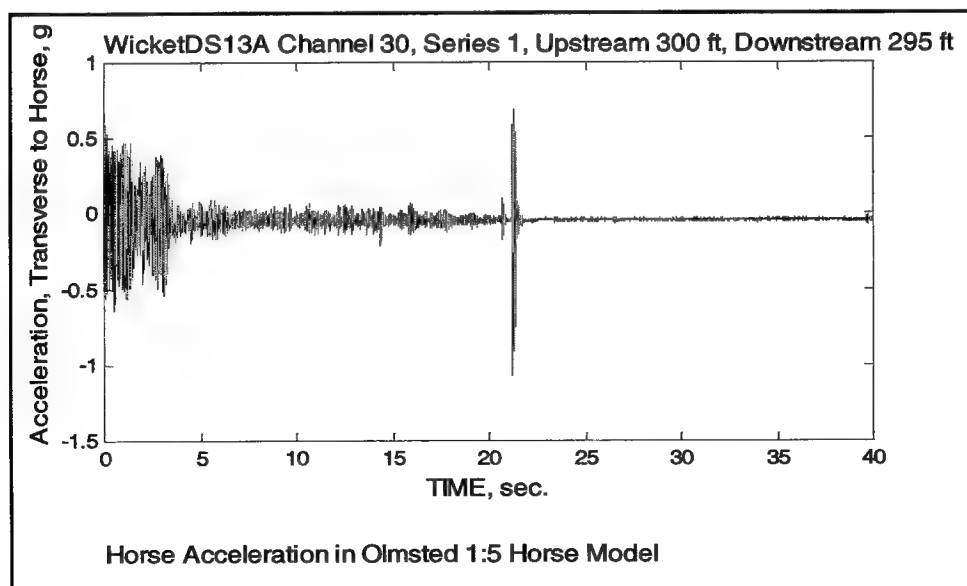


Figure 89. Horse acceleration – bottom-lift drop test, 2-gate gap

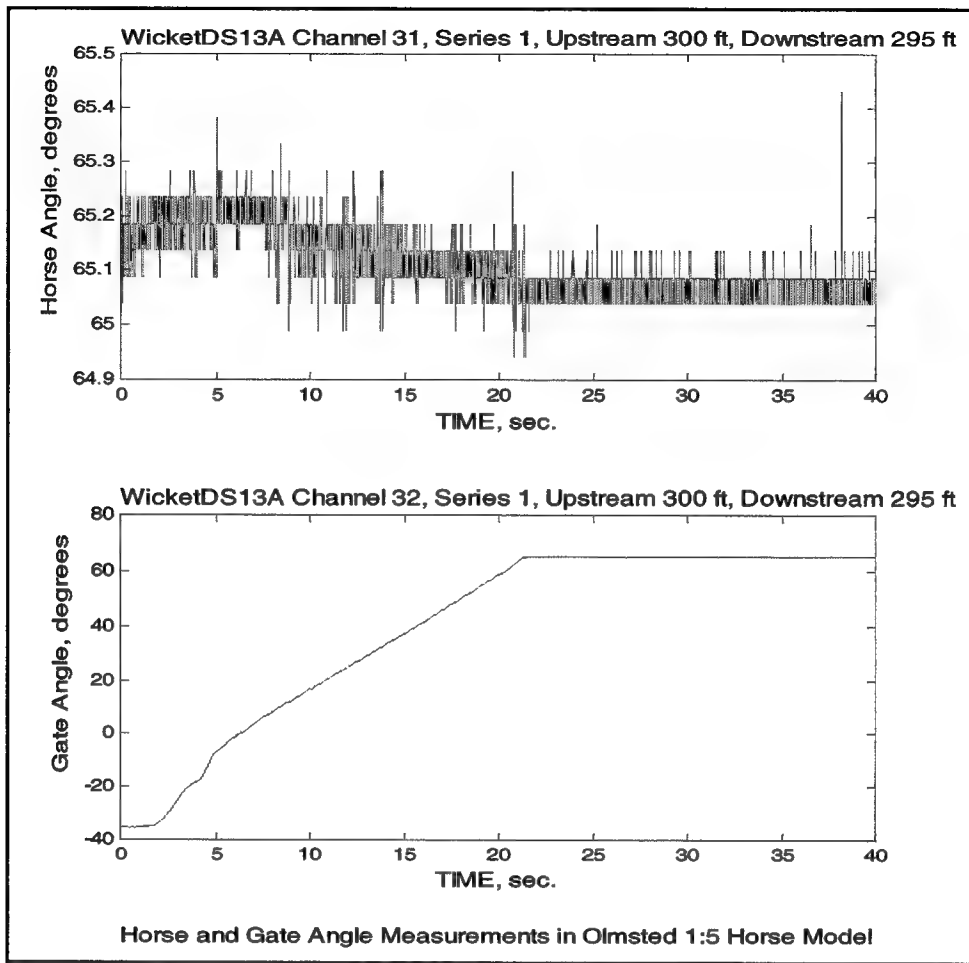


Figure 90. Horse and gate angle as a function of time – bottom-lift drop test, 2-gate gap

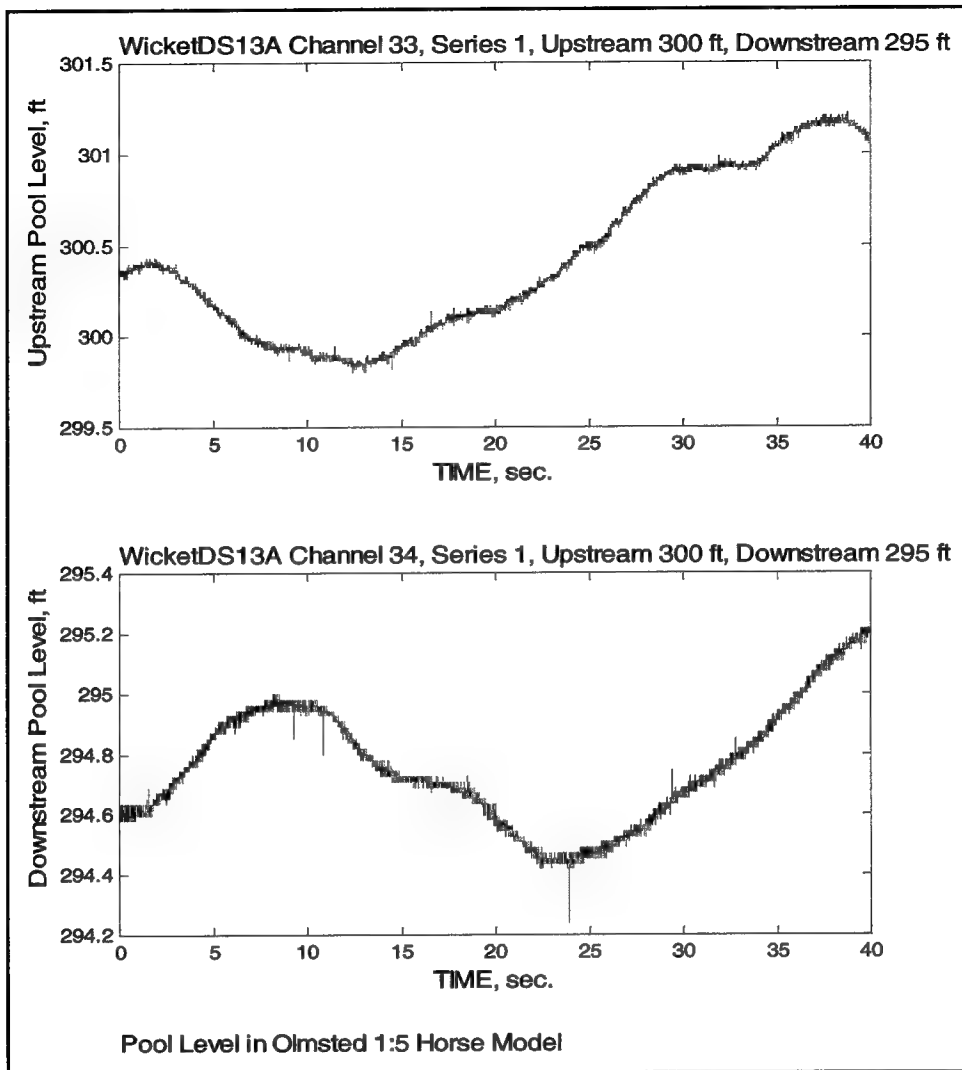


Figure 91. Pool elevations – bottom-lift drop test, 2-gate gap

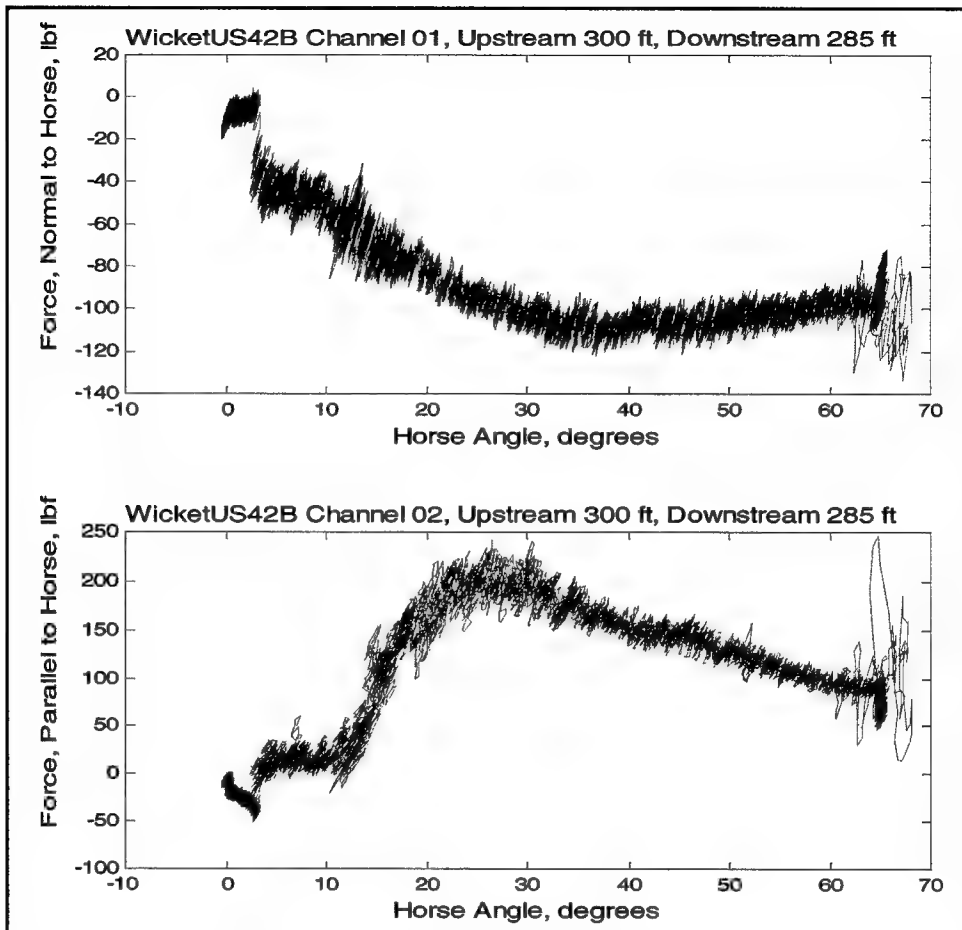


Figure 92. Horse bottom right hinge reactions – bottom lift unusual, no gap



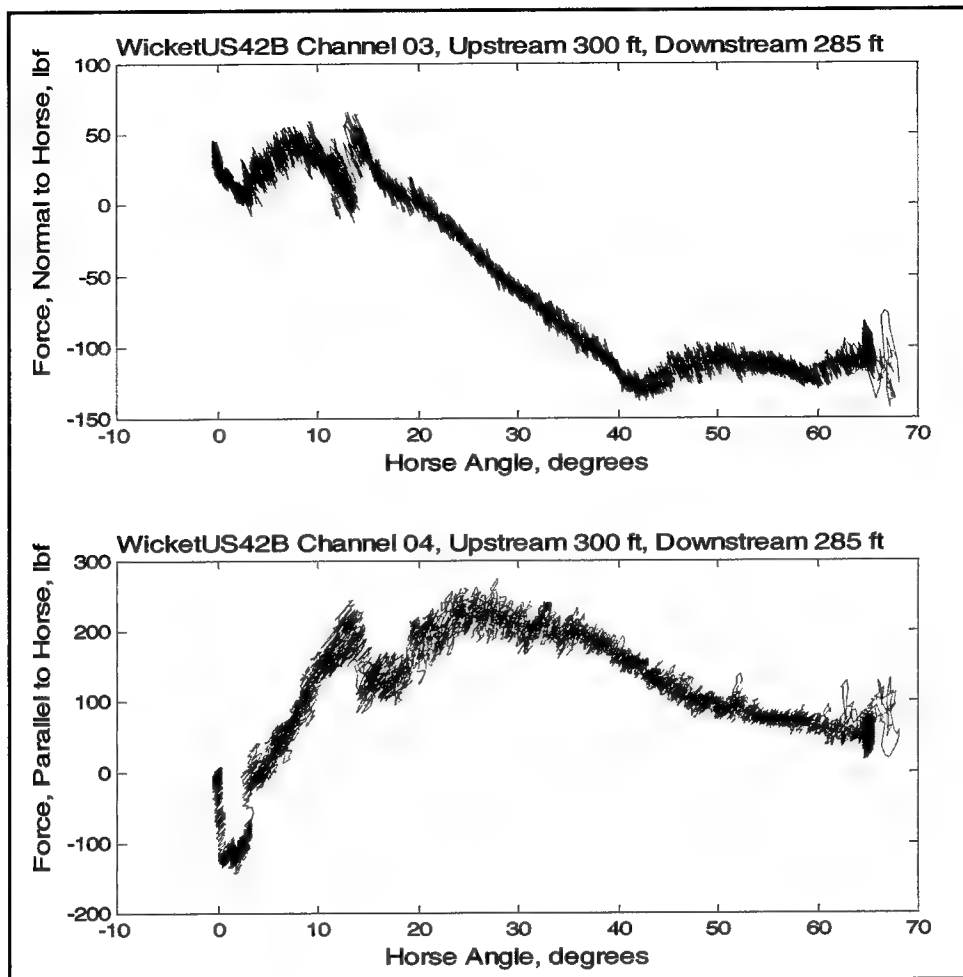


Figure 93. Horse bottom left hinge reactions – bottom lift unusual, no gap

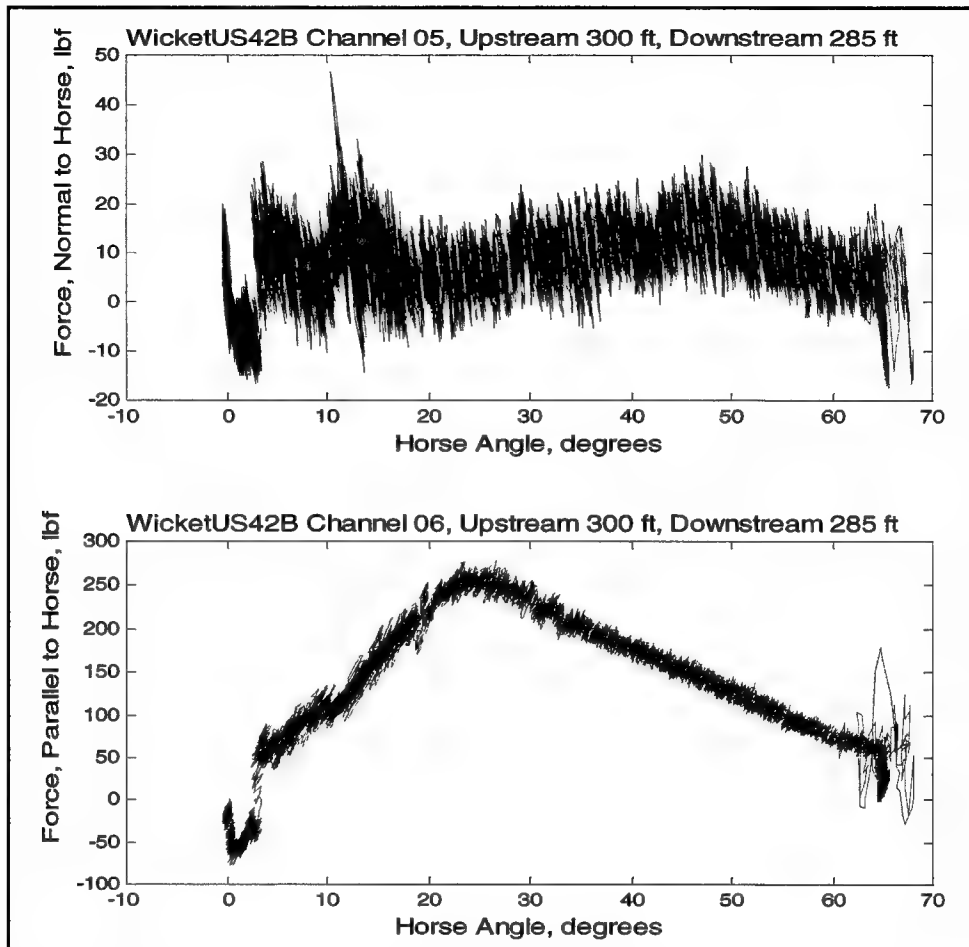


Figure 94. Horse top right hinge reactions – bottom lift unusual, no gap

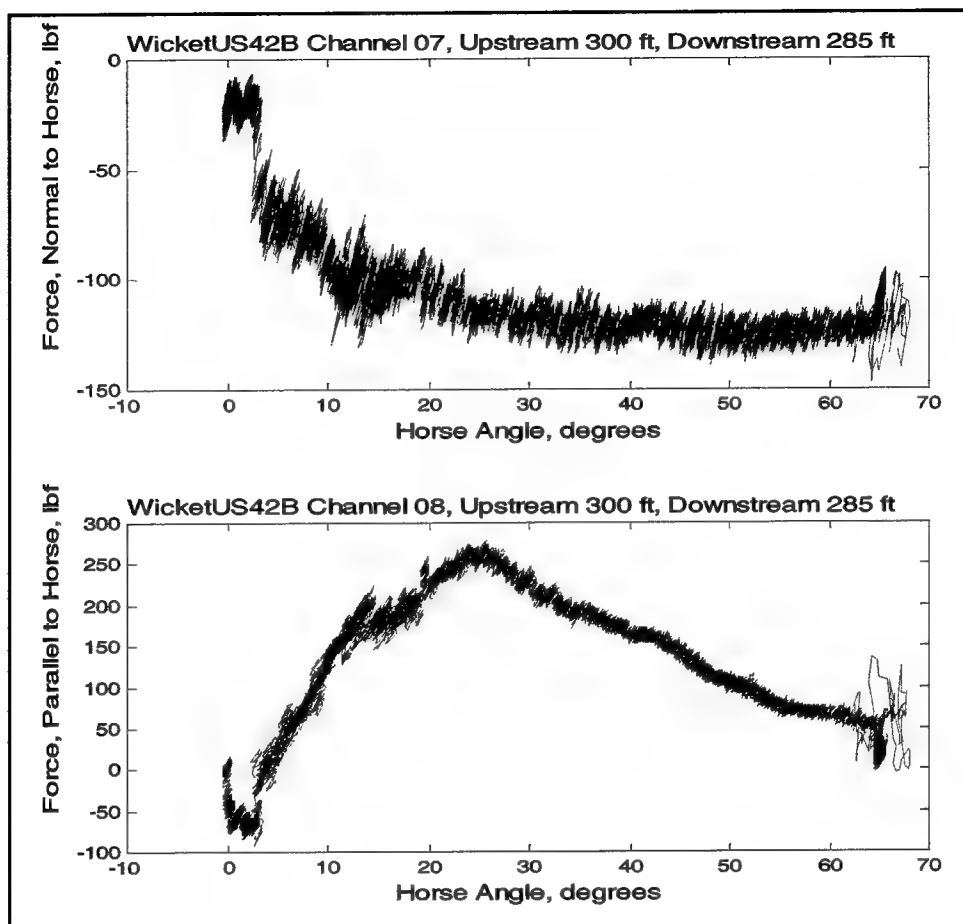


Figure 95. Horse top left hinge reactions – bottom lift unusual, no gap

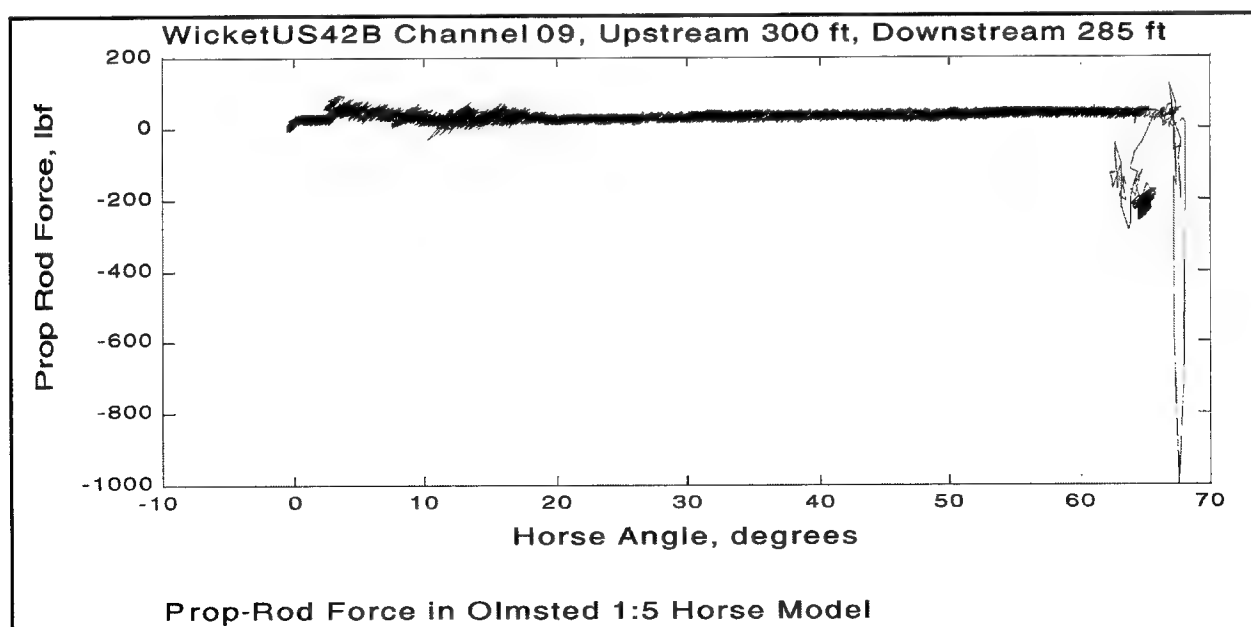


Figure 96. Prop-rod reaction – bottom lift unusual, no gap

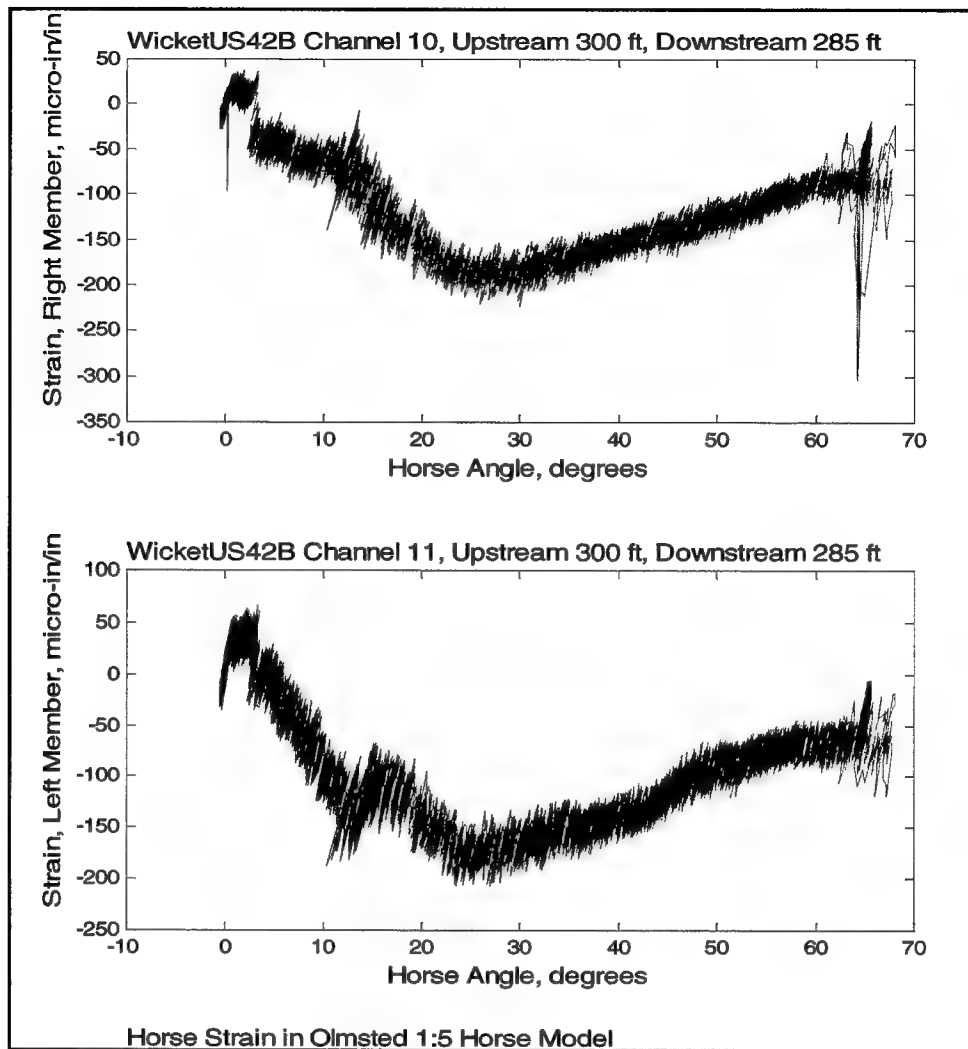


Figure 97. Horse strain, parallel bars – bottom lift unusual, no gap

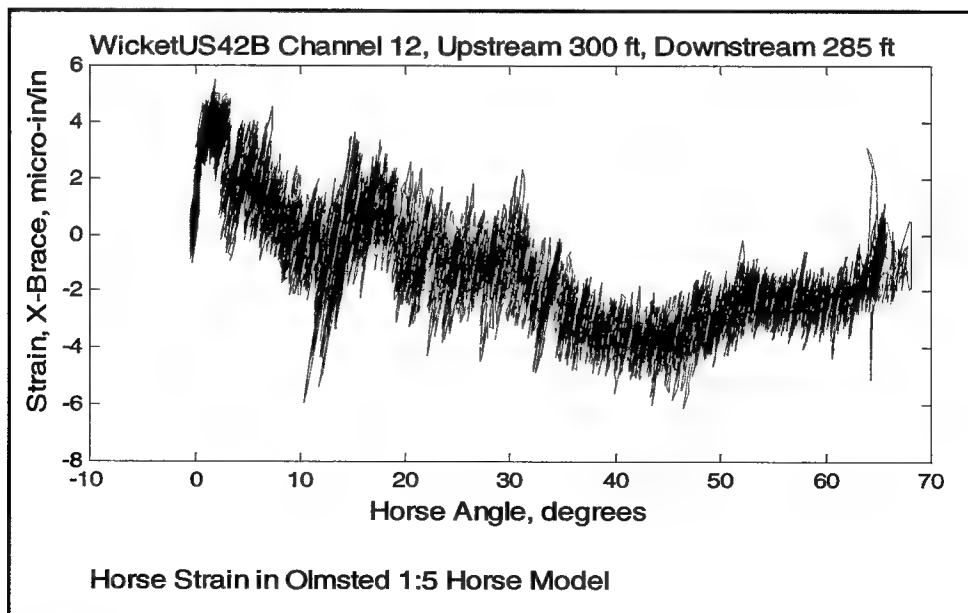


Figure 98. Horse strain, x-bracing – bottom lift unusual, no gap

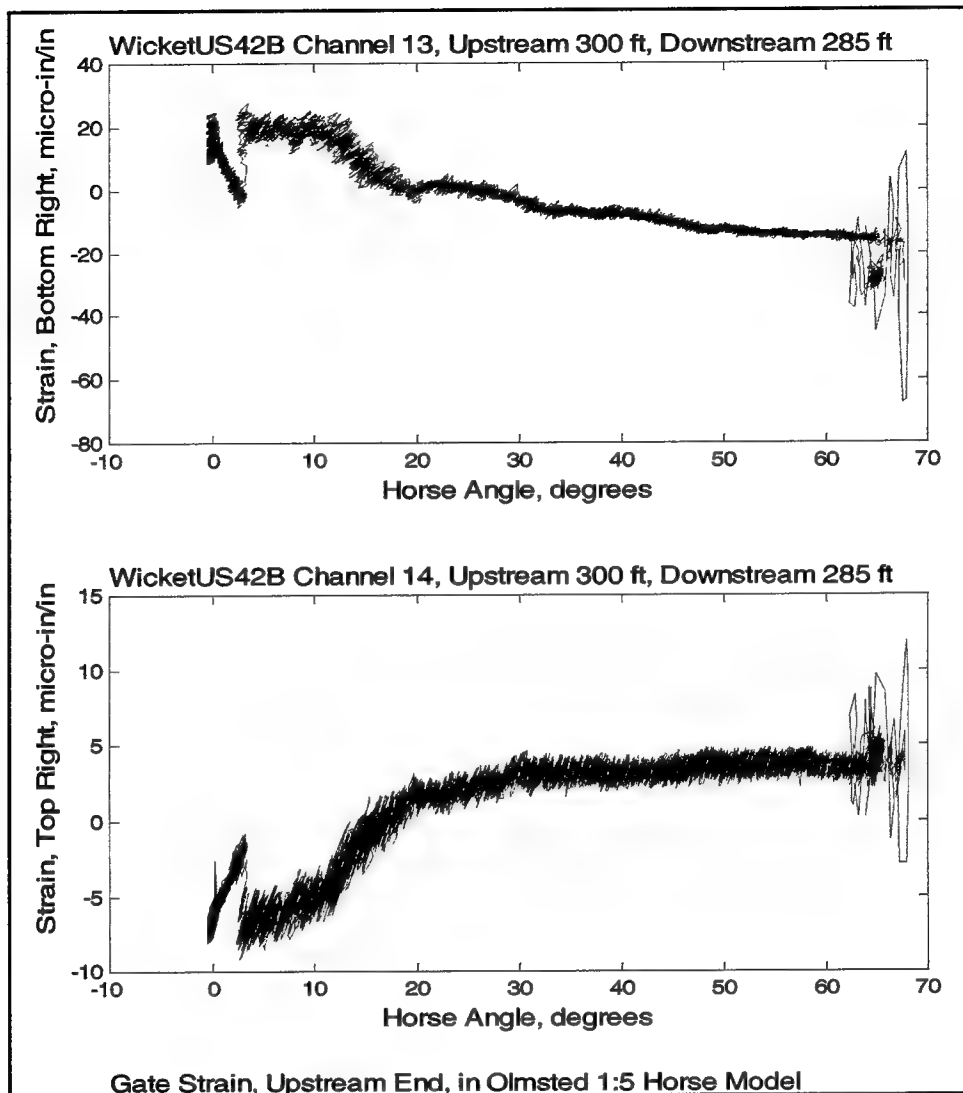


Figure 99. Gate strain, upstream end – bottom lift unusual, no gap

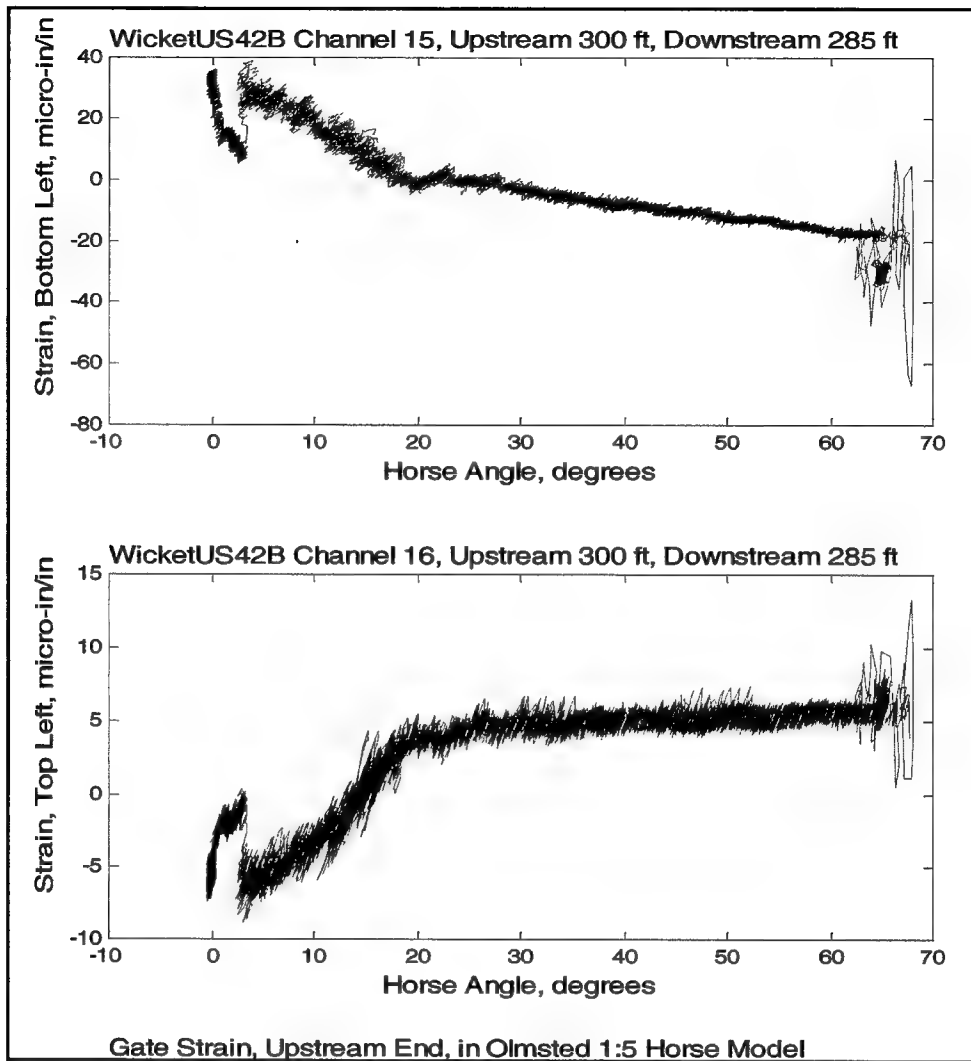


Figure 100. Gate strain, upstream end – bottom lift unusual, no gap

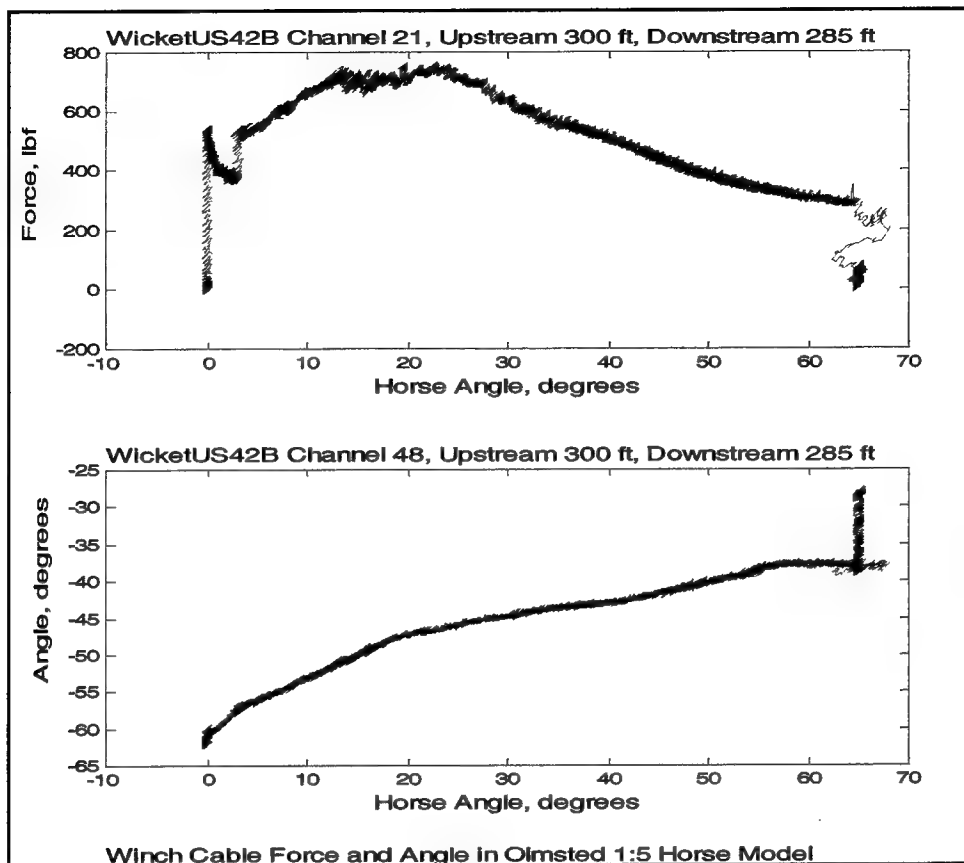


Figure 101. Winch cable measurements – bottom lift unusual, no gap

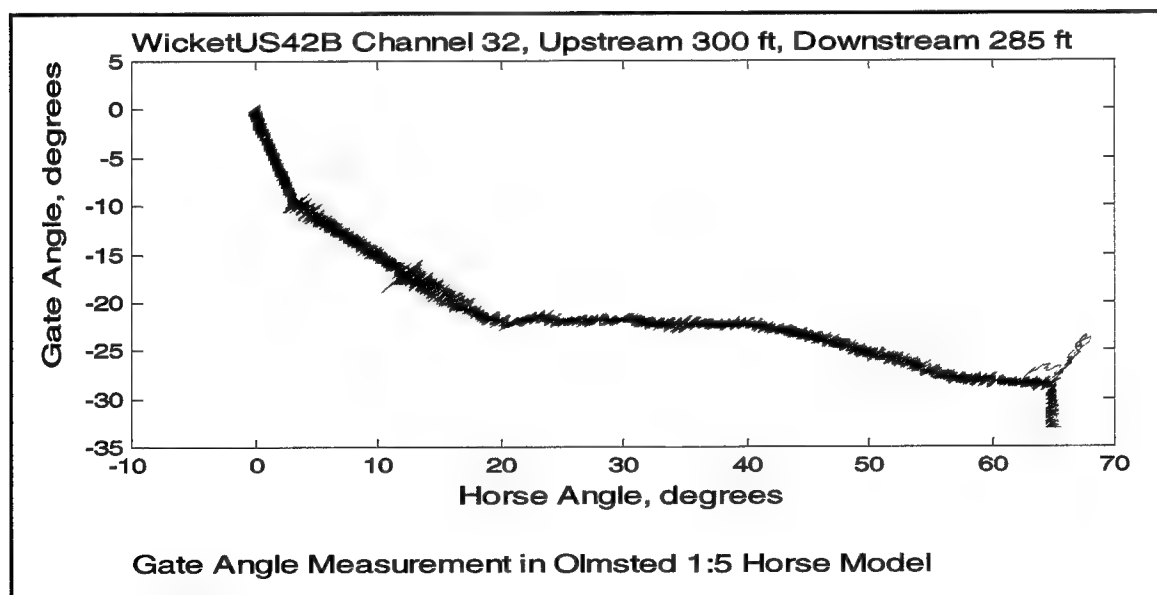


Figure 102. Gate angle as a function of horse angle – bottom lift unusual, no gap

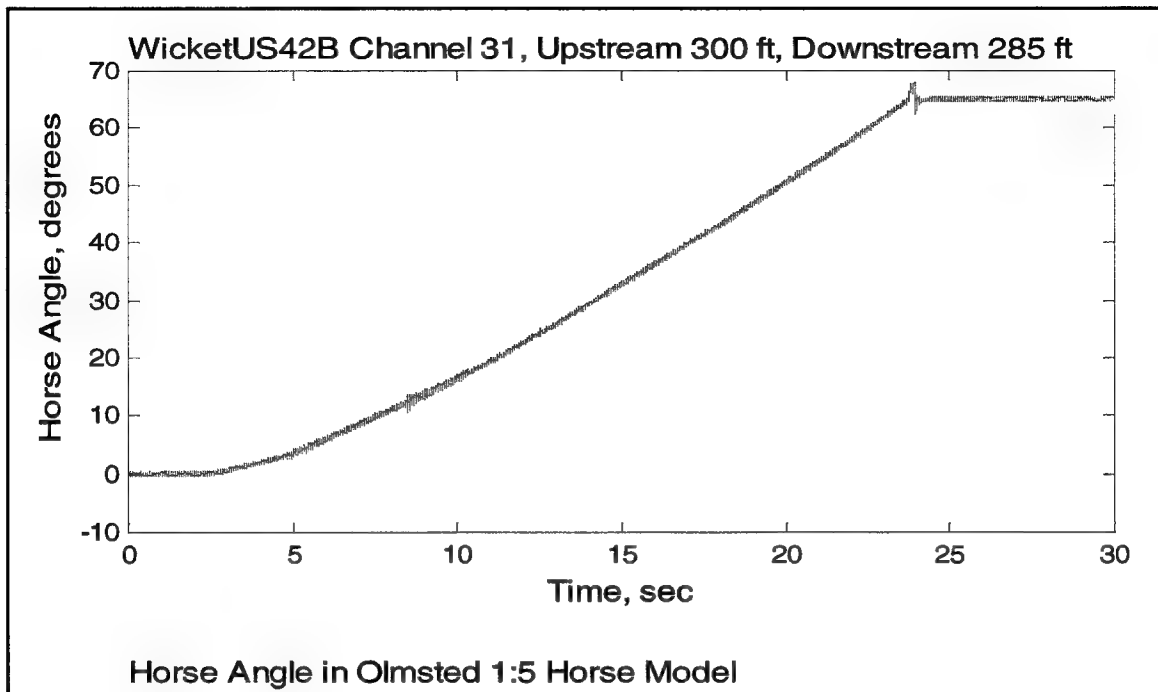


Figure 103. Horse angle as a function of time – bottom lift unusual, no gap

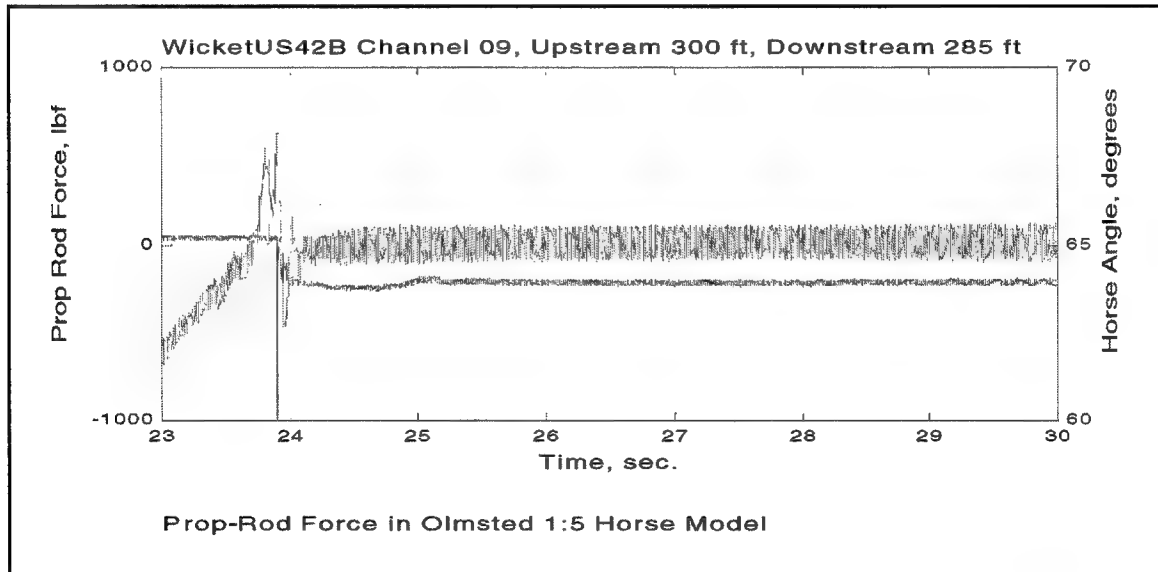


Figure 104. Prop-rod as it got engaged during the operation – bottom lift unusual, no gap



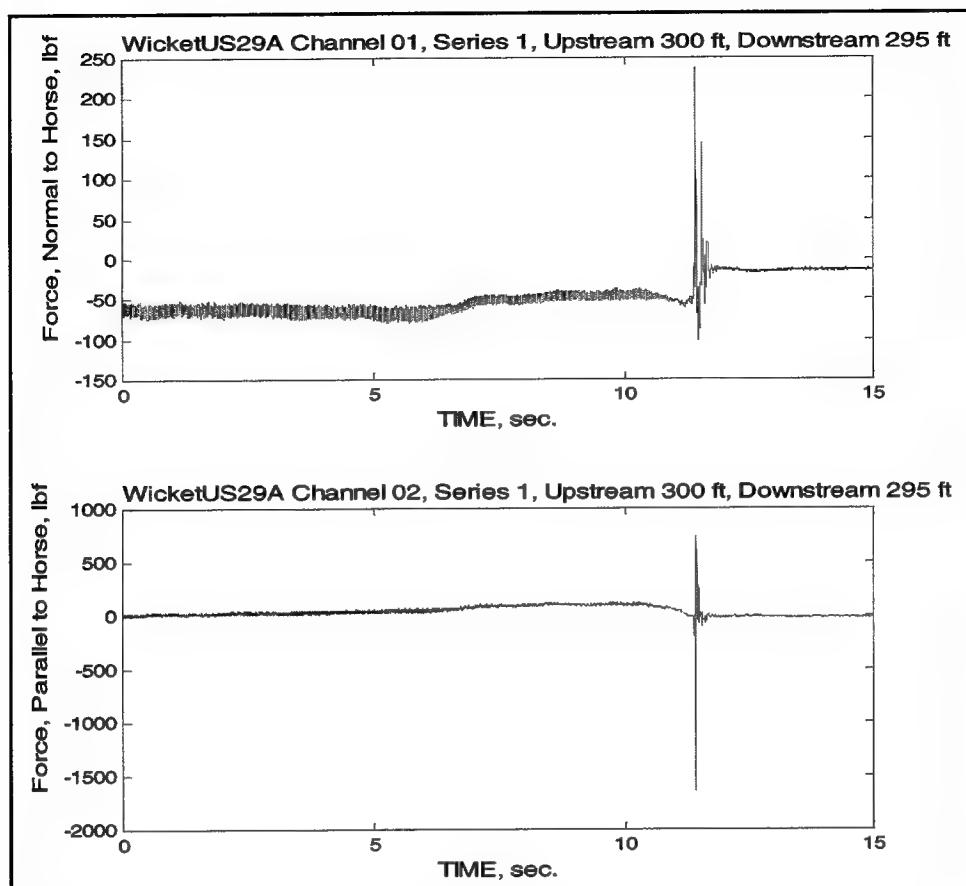


Figure 105. Horse bottom right hinge reactions – bottom-lift drop test, no gap

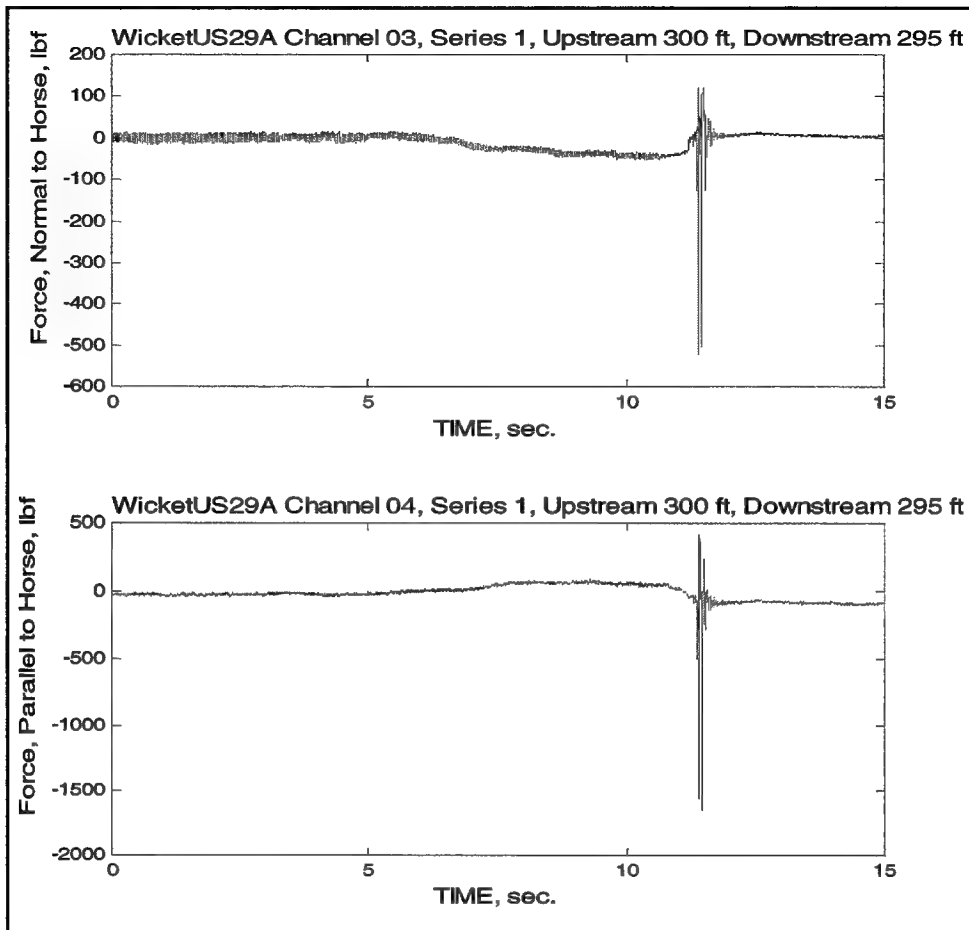


Figure 106. Horse bottom left hinge reactions – bottom-lift drop test, no gap

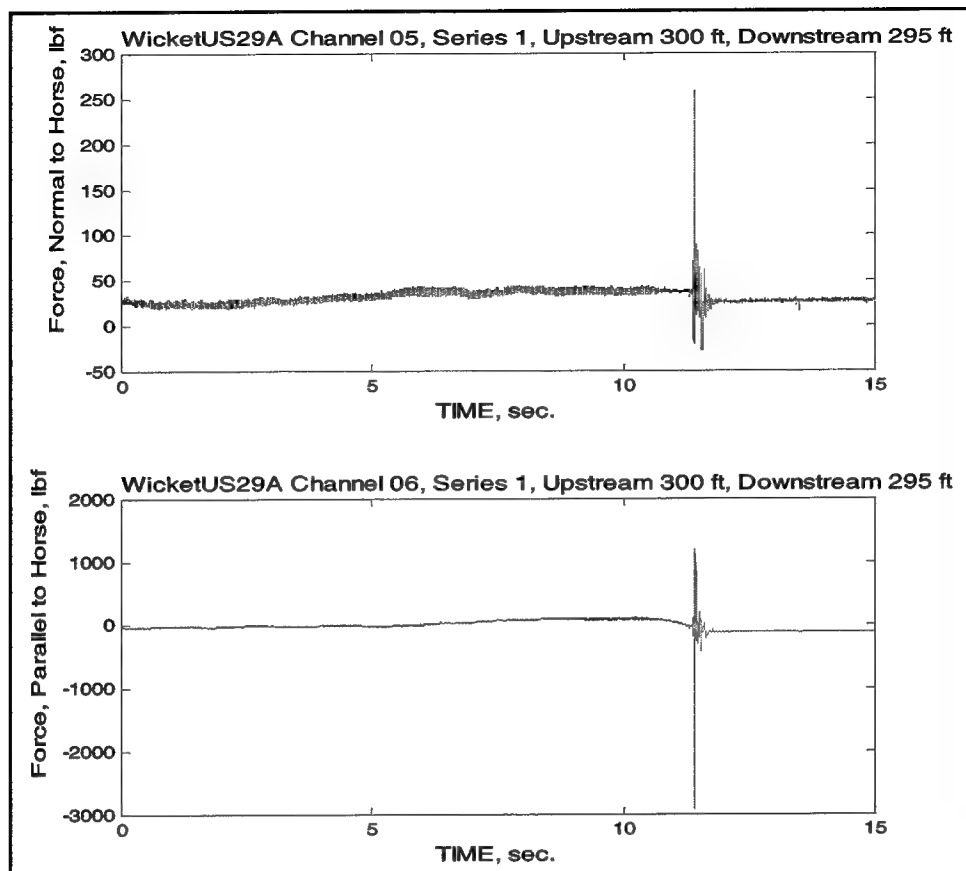


Figure 107. Horse top right hinge reactions – bottom-lift drop test, no gap

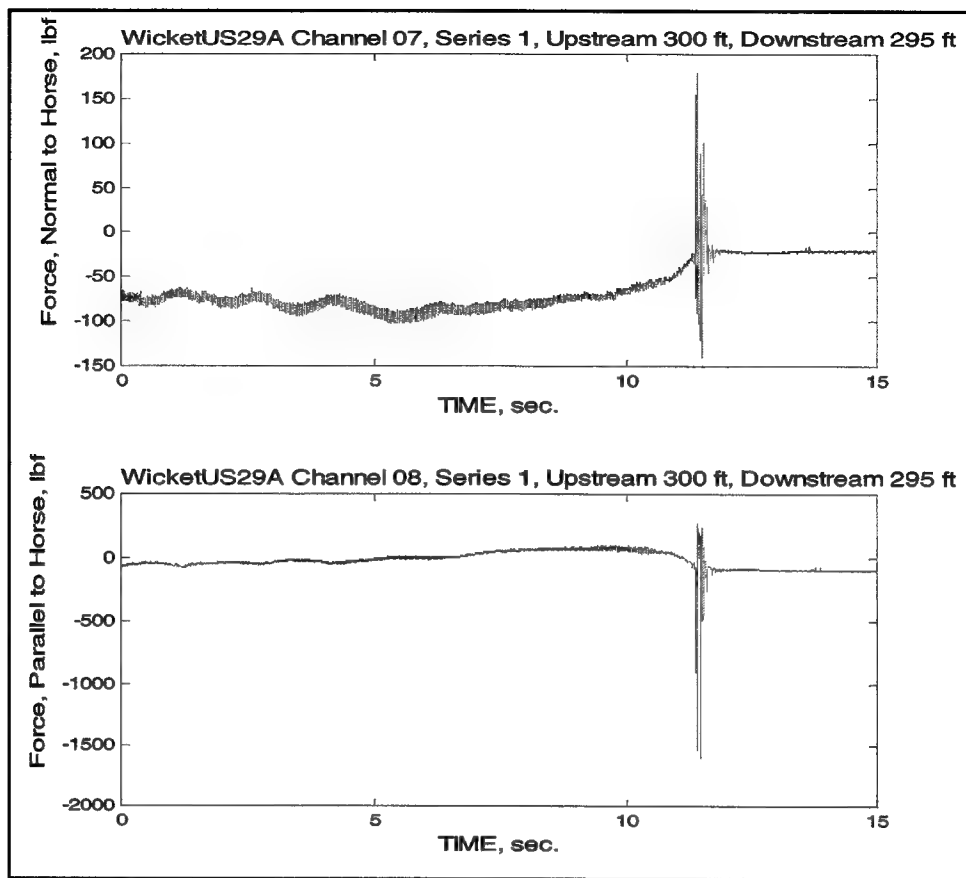


Figure 108. Horse top left hinge reactions – bottom-lift drop test, no gap

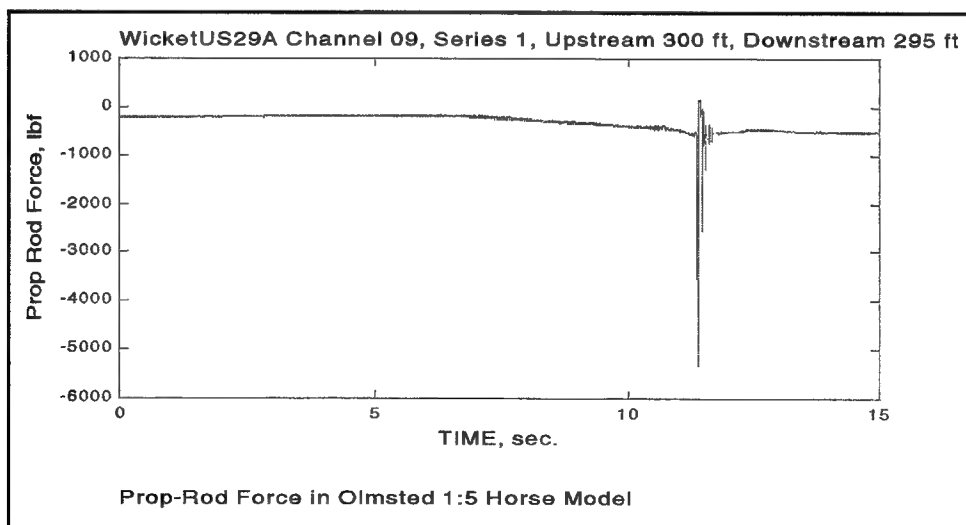


Figure 109. Prop-rod force – bottom-lift drop test, no gap

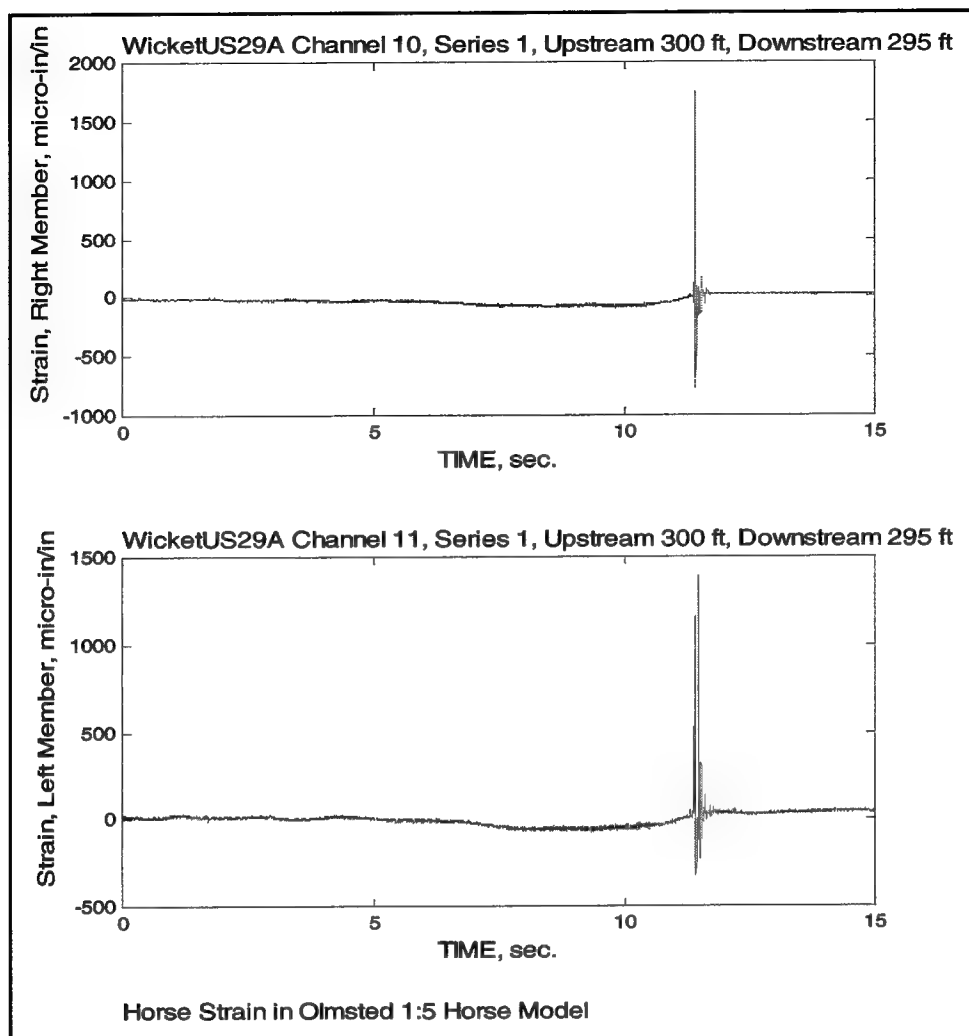


Figure 110. Horse strain – bottom-lift drop test, no gap

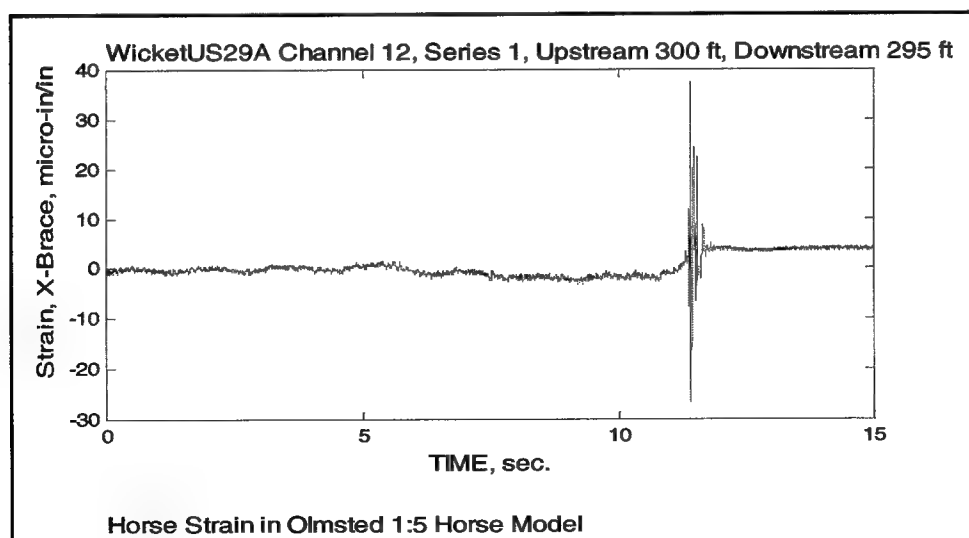


Figure 111. Horse strain – bottom-lift drop test, no gap

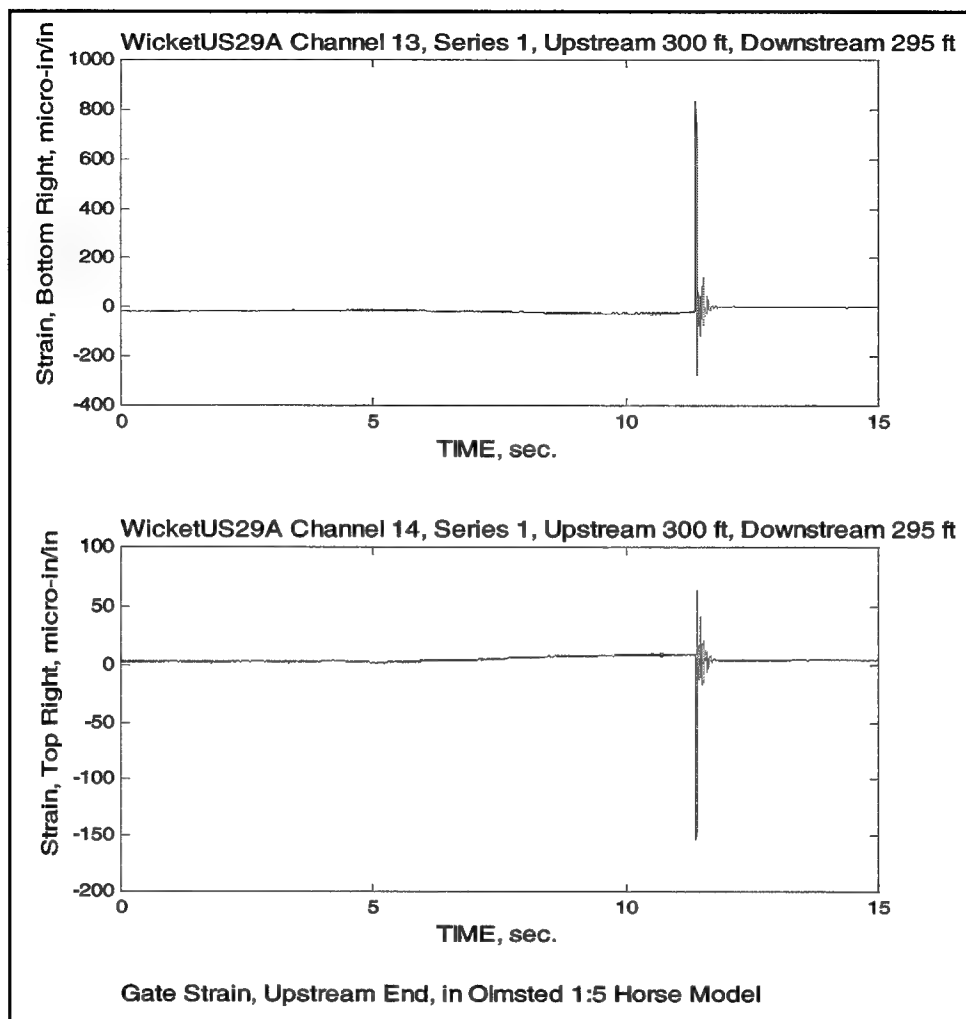


Figure 112. Gate strain – bottom-lift drop test, no gap

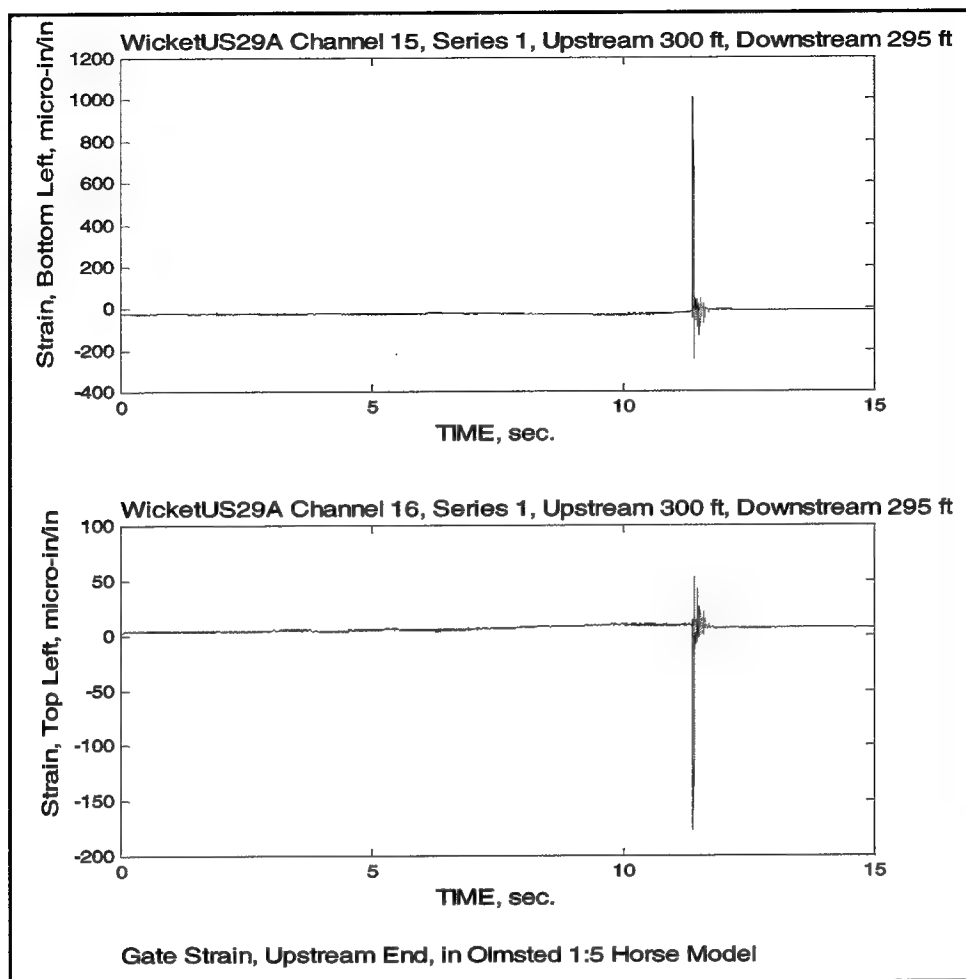


Figure 113. Gate strain – bottom-lift drop test, no gap

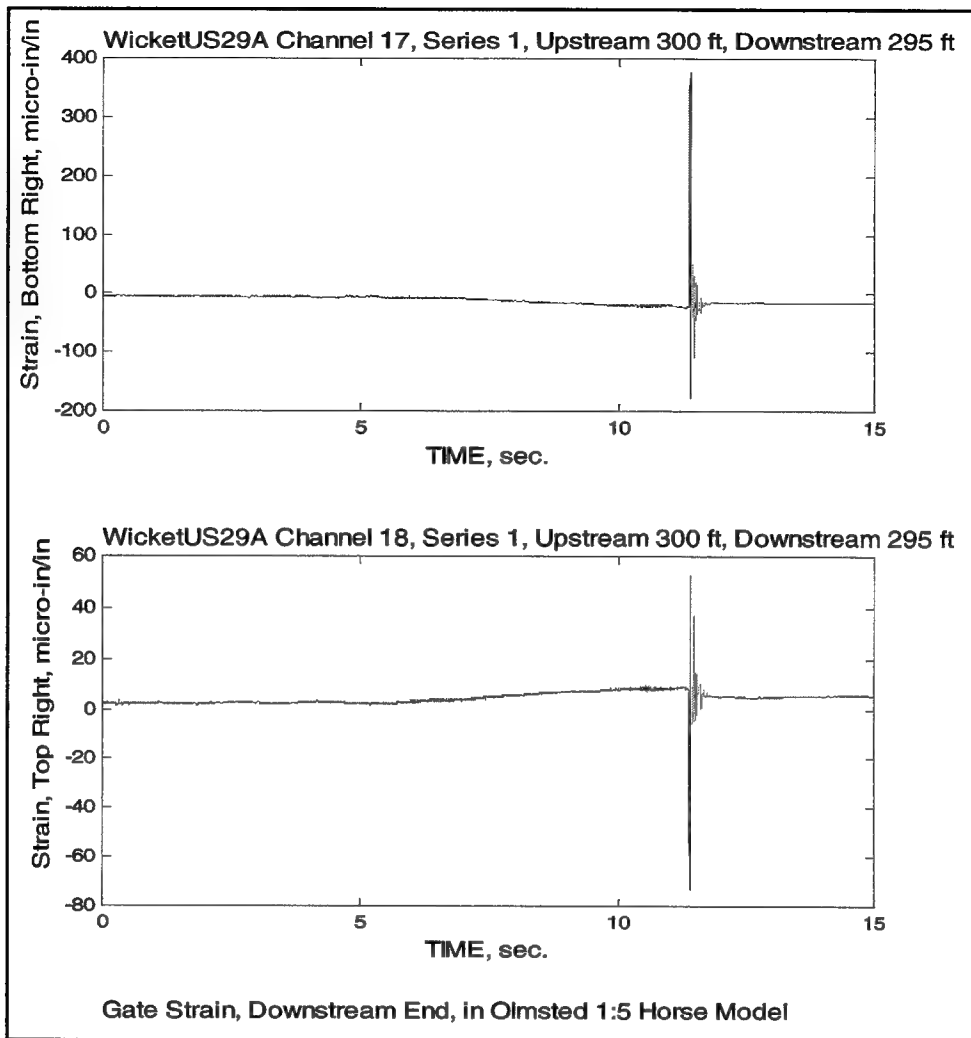


Figure 114. Gate strain – bottom-lift drop test, no gap



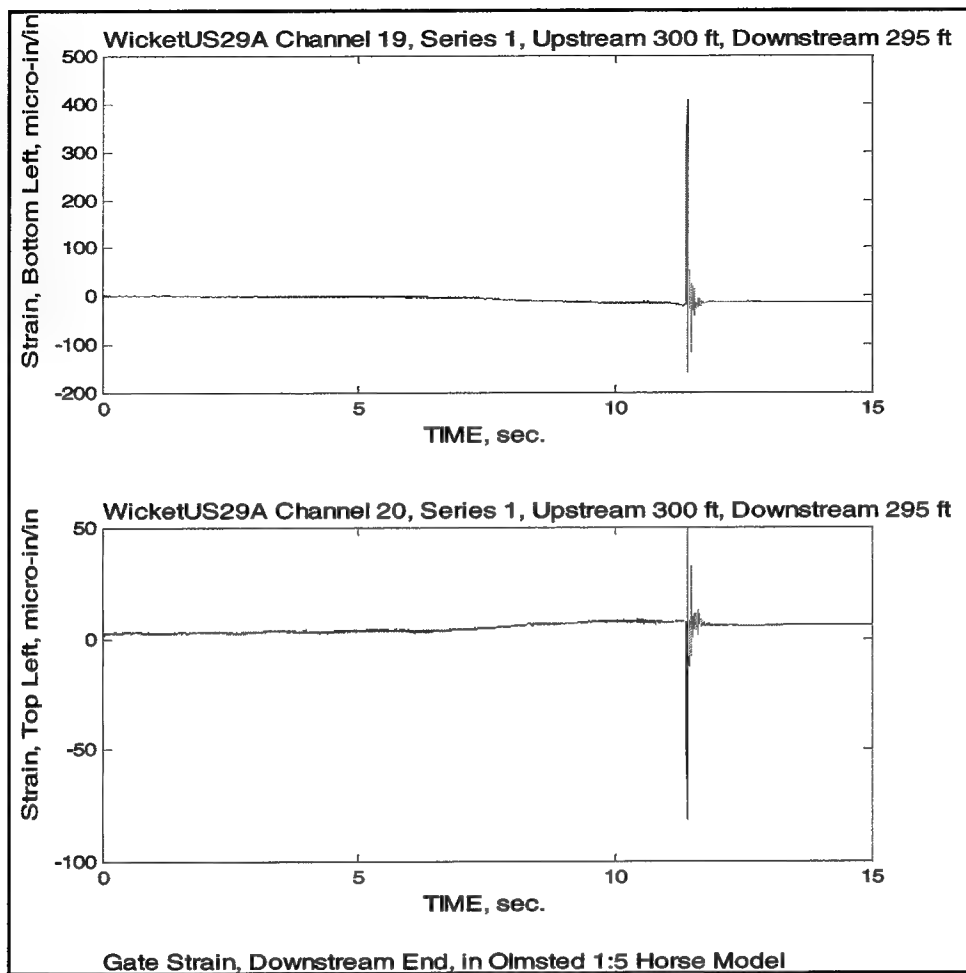


Figure 115. Gate strain – bottom-lift drop test, no gap

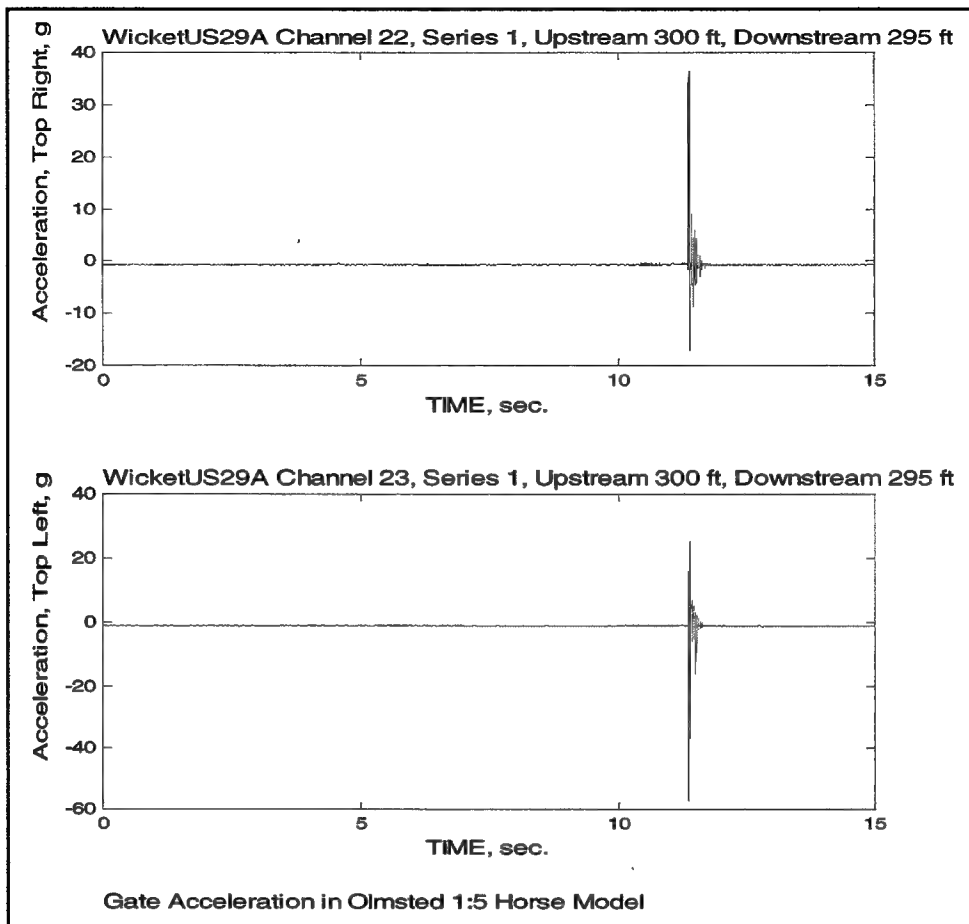


Figure 116. Gate acceleration – bottom-lift drop test, no gap

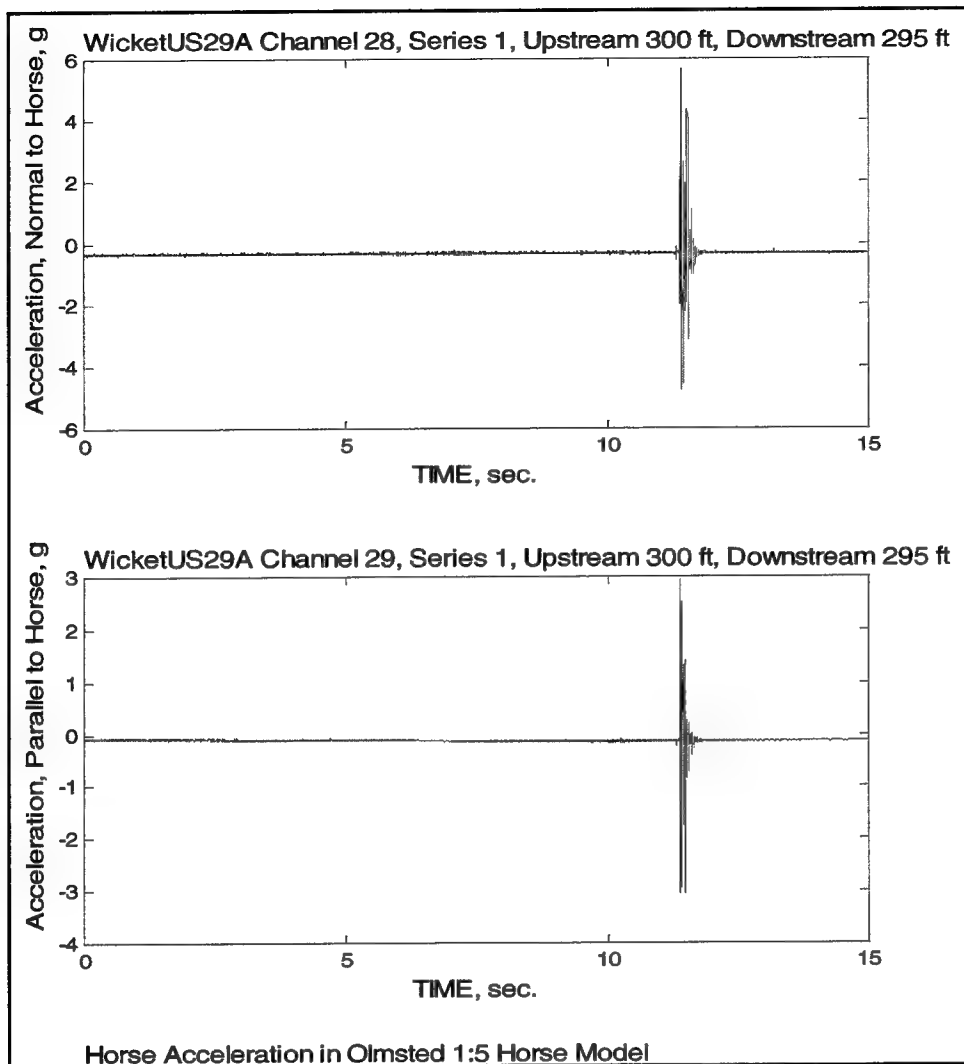


Figure 117. Horse acceleration – bottom-lift drop test, no gap

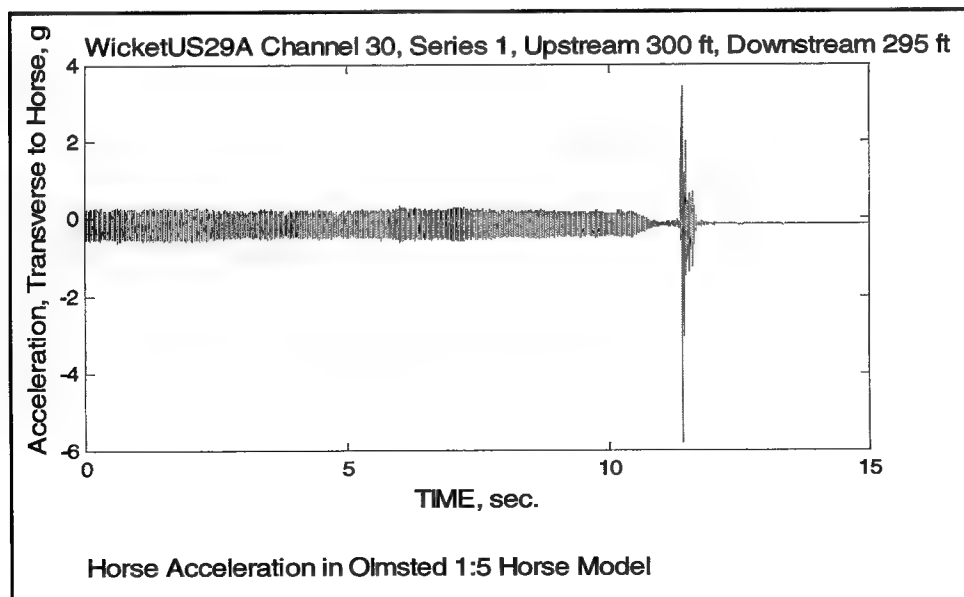


Figure 118. Horse acceleration – bottom-lift drop test, no gap

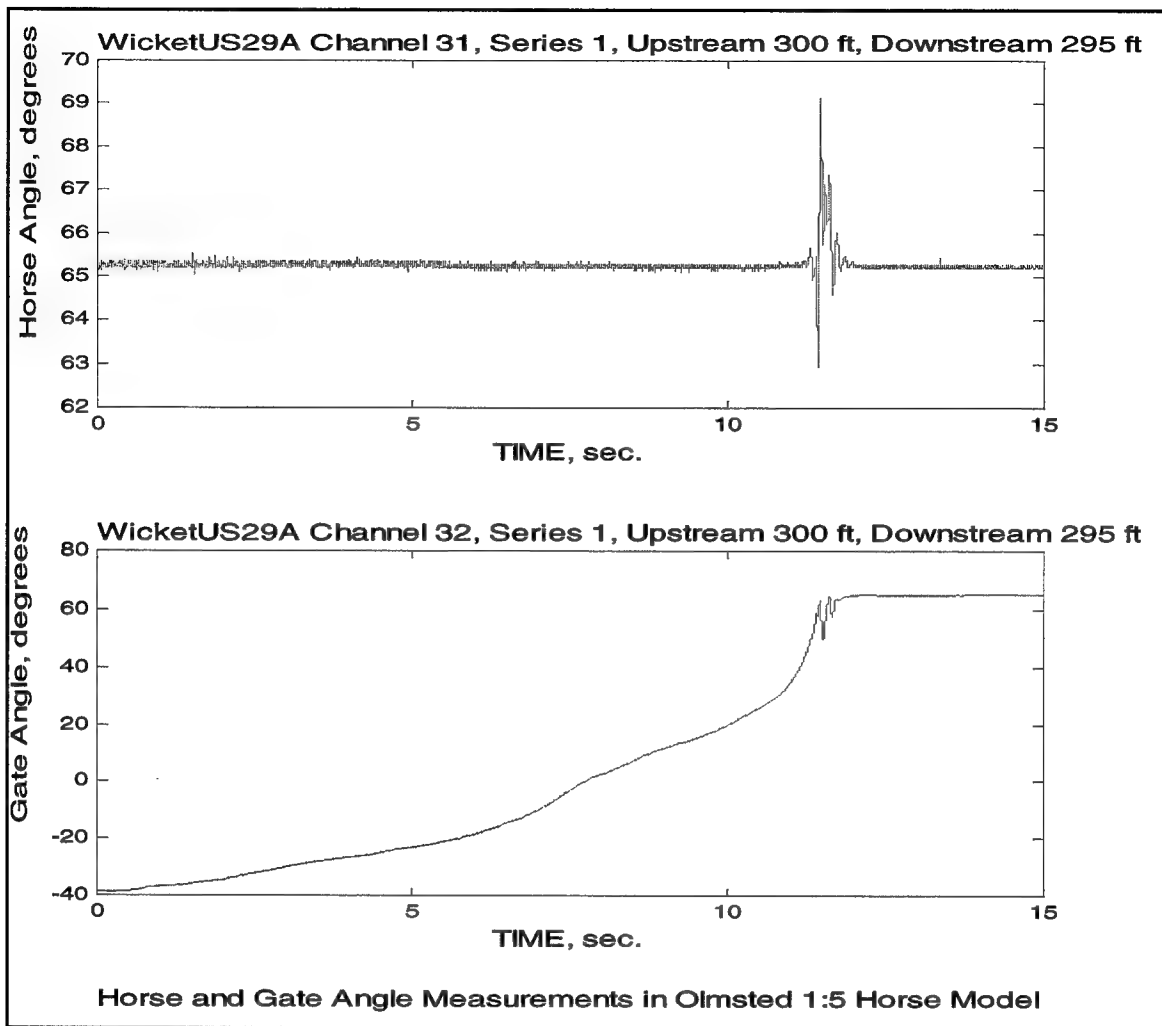


Figure 119. Gate and horse angle during the flipping operation— bottom-lift drop test, no gap

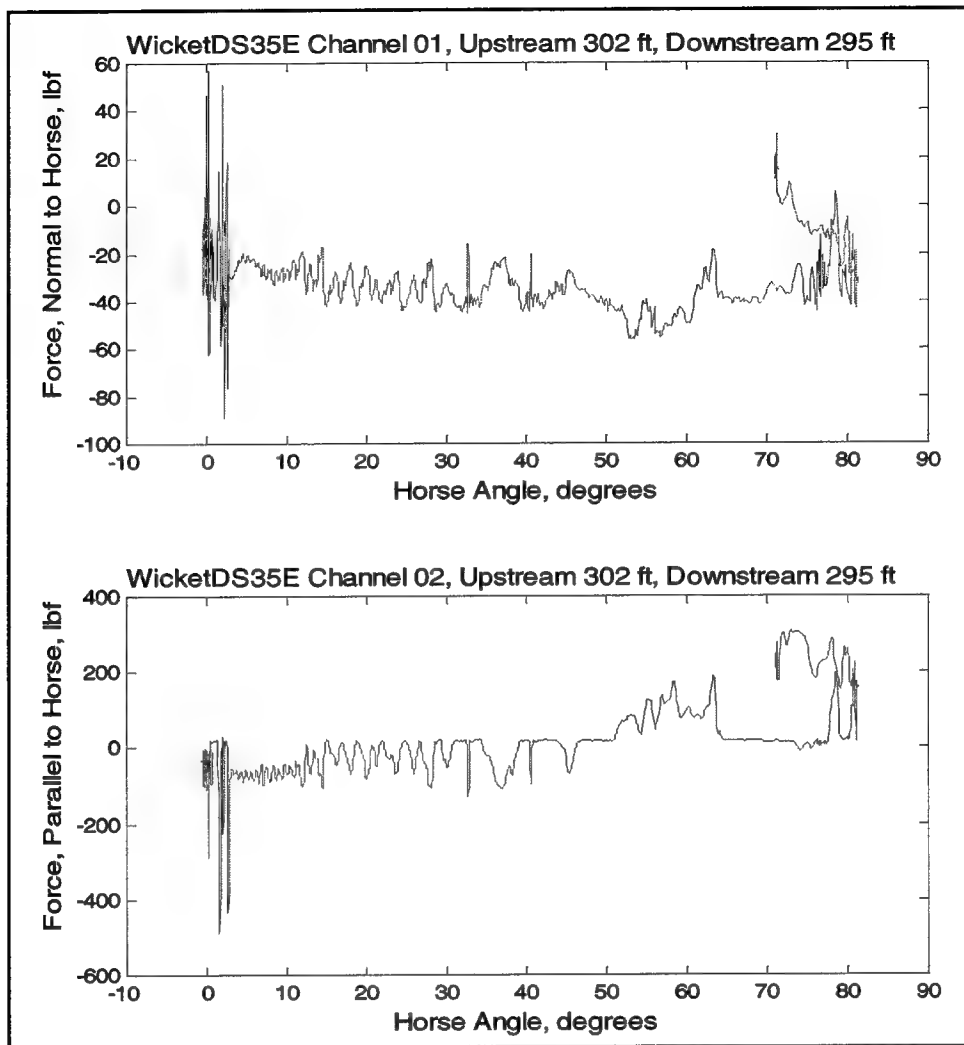


Figure 120. Horse bottom right hinge reactions – bottom-lift flipping test, 3-gate gap

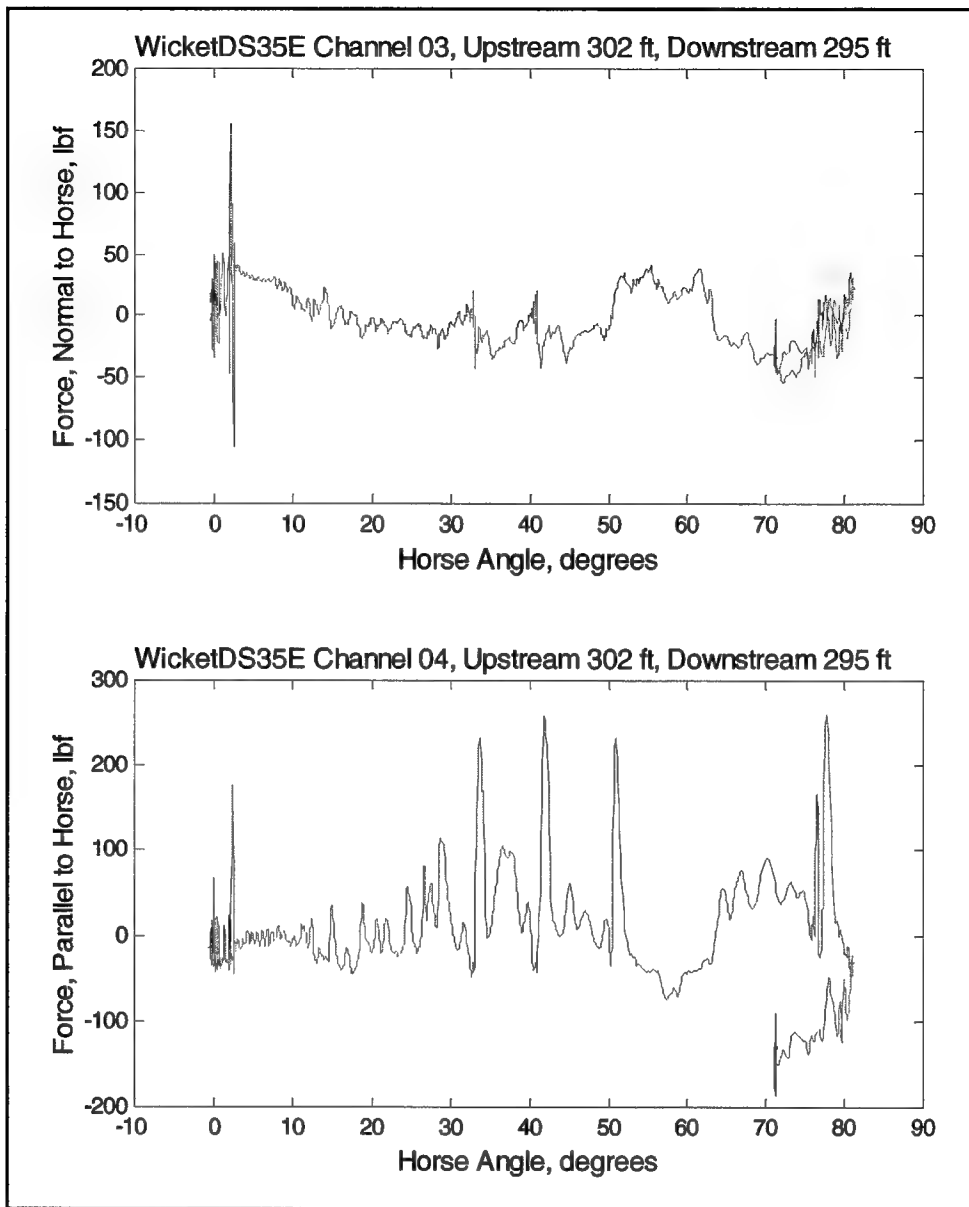


Figure 121. Horse bottom left hinge reactions – bottom-lift flipping test, 3-gate gap

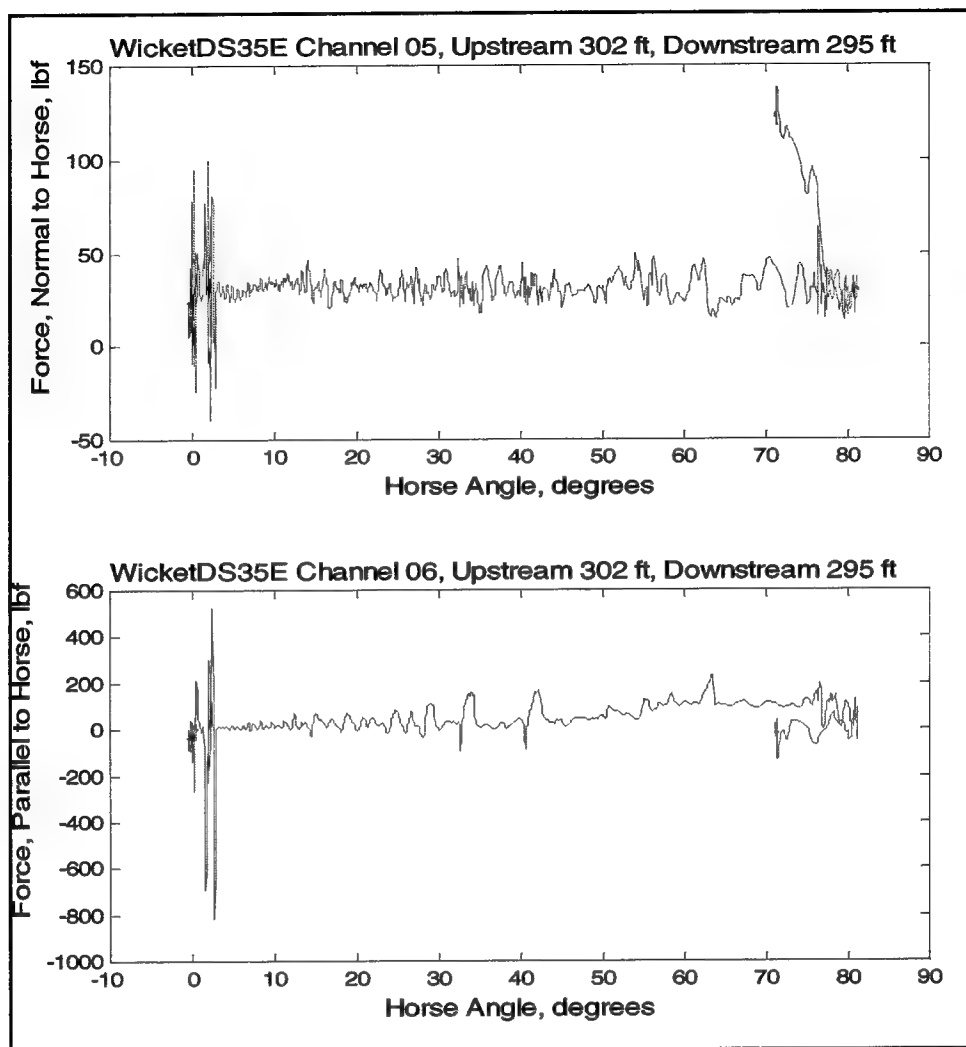


Figure 122. Horse top right hinge reactions – bottom-lift flipping test, 3-gate gap

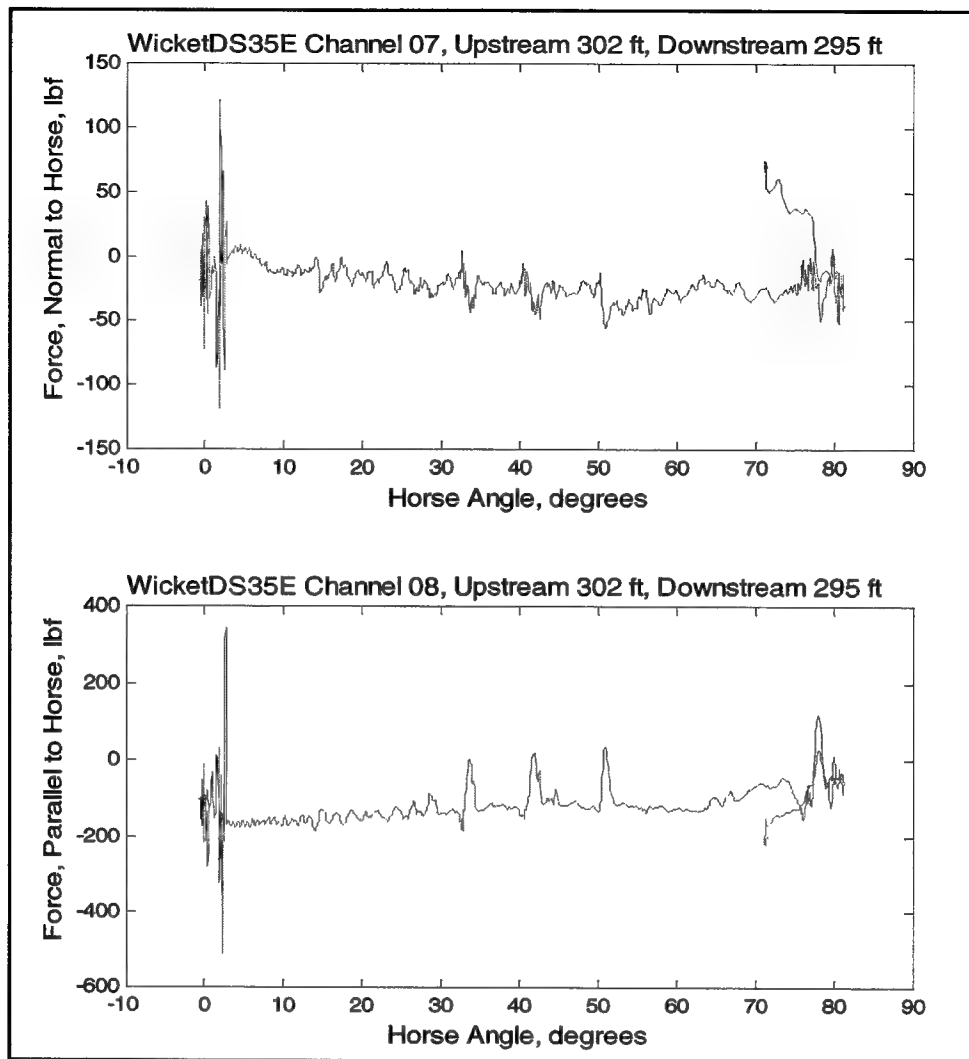


Figure 123. Horse top left hinge reactions – bottom-lift flipping test, 3-gate gap



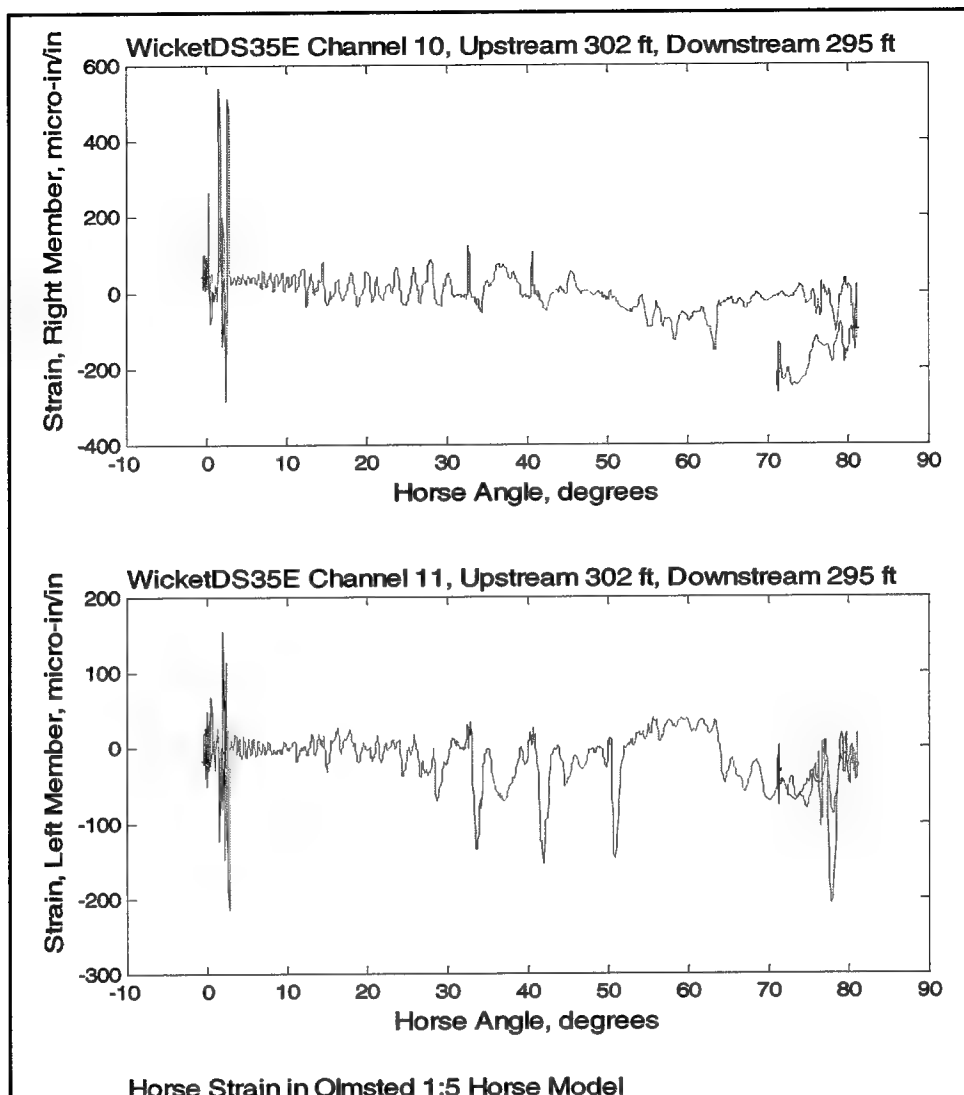


Figure 124. Horse strain – bottom-lift flipping test, 3-gate gap

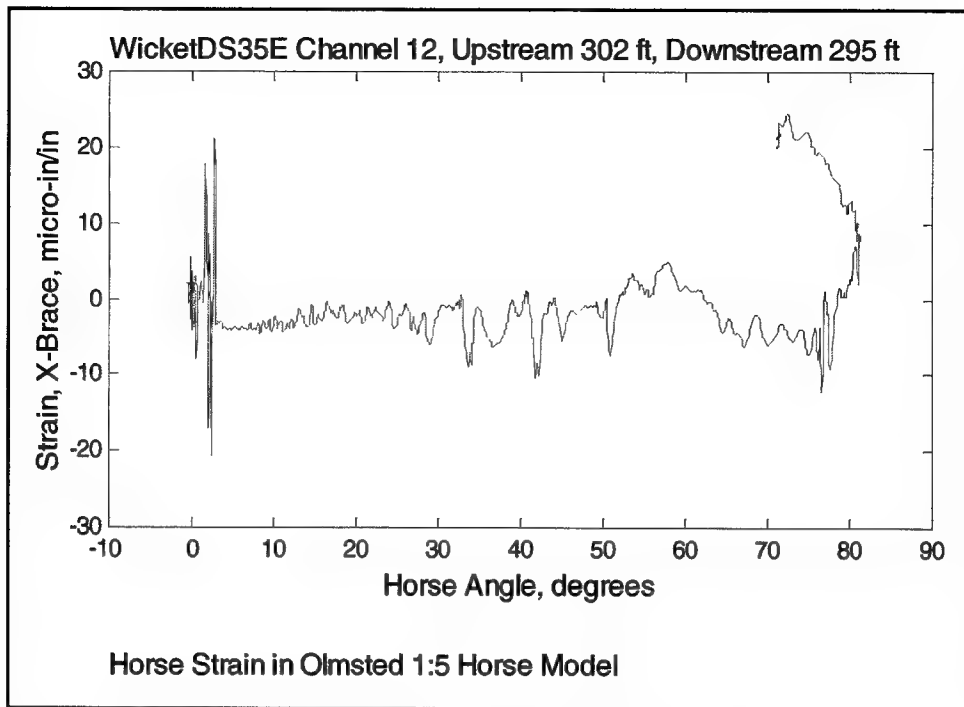


Figure 125. Horse strain – bottom-lift flipping test, 3-gate gap

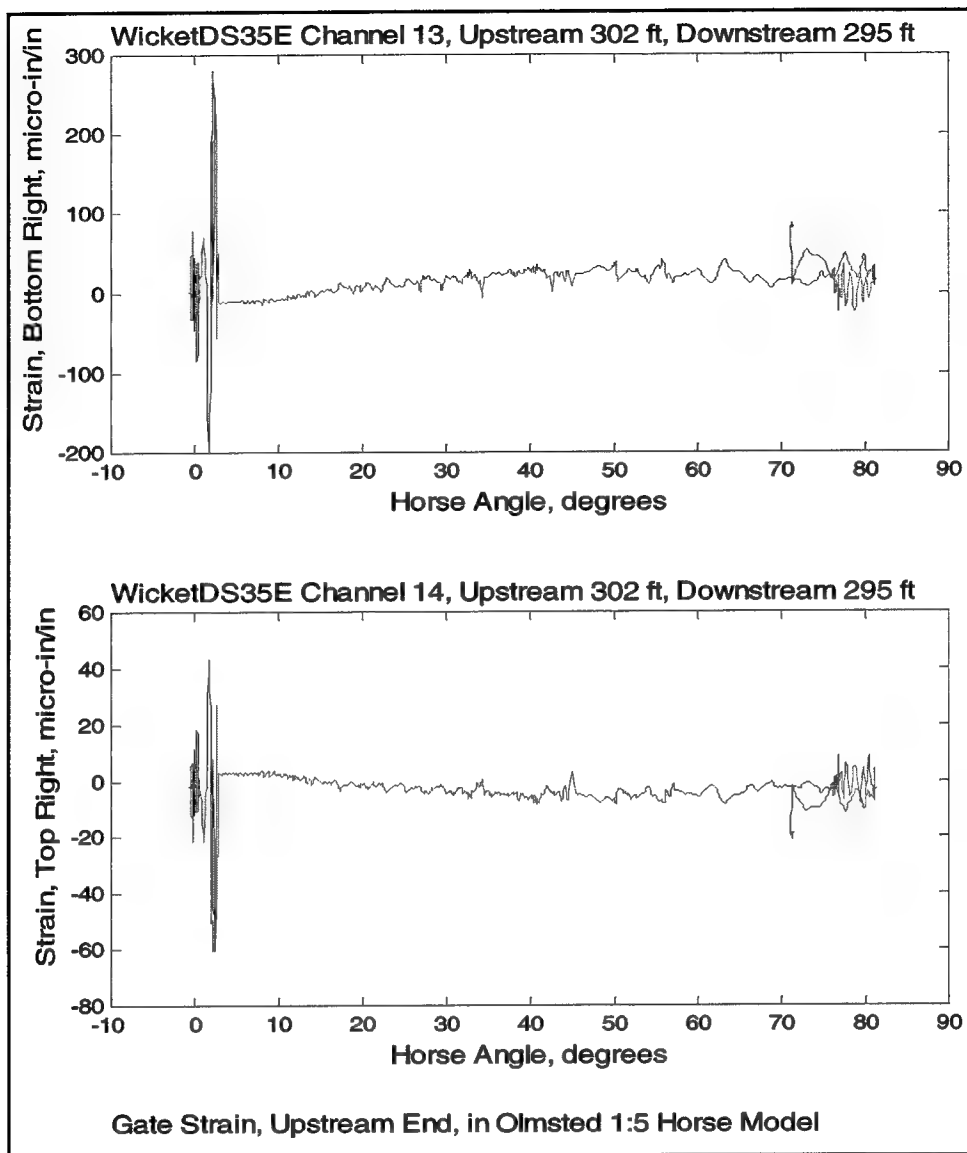


Figure 126. Gate strain – bottom-lift flipping test, 3-gate gap

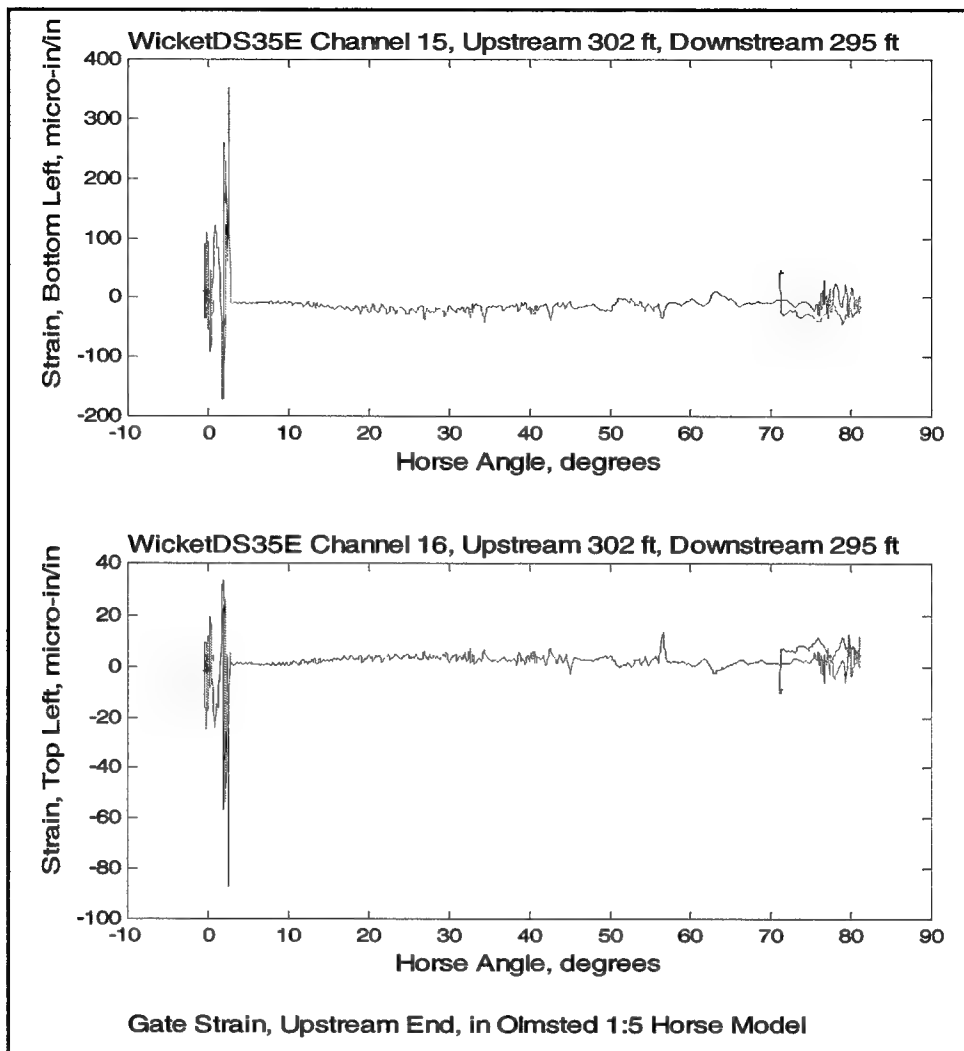


Figure 127. Gate strain – bottom-lift flipping test, 3-gate gap

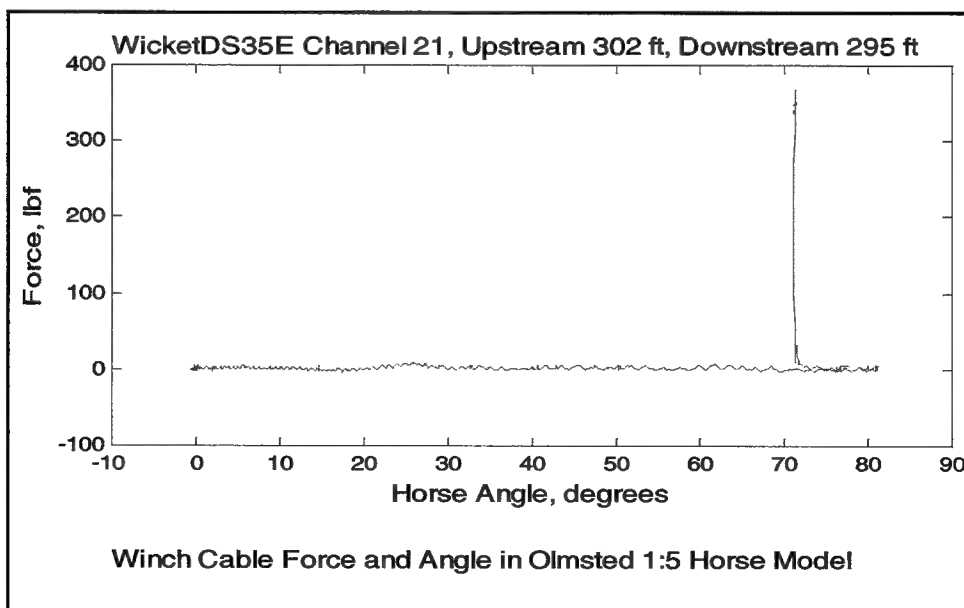


Figure 128. Winch cable measurements – bottom-lift flipping test, 3-gate gap

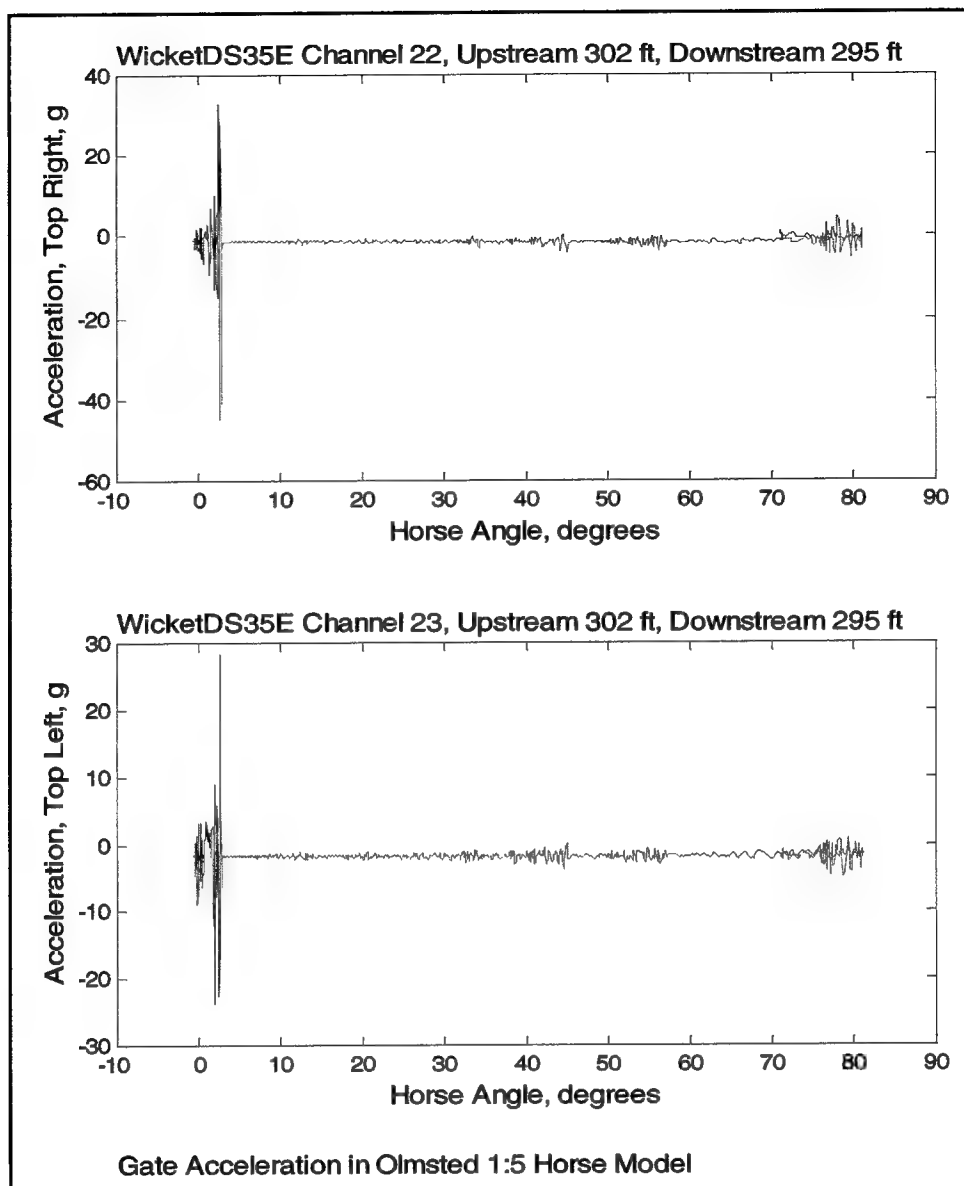


Figure 129. Gate acceleration – bottom-lift flipping test, 3-gate gap

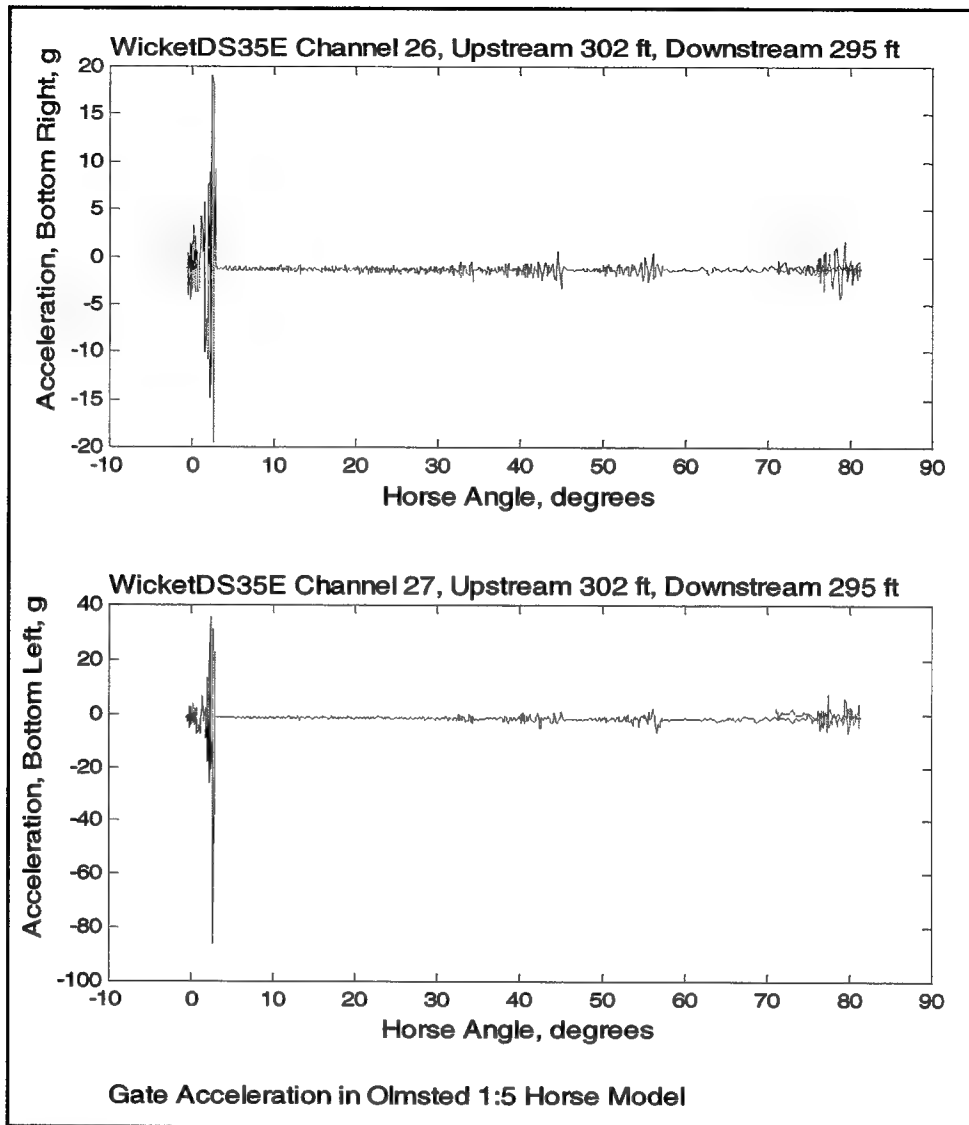


Figure 130. Gate acceleration – bottom-lift flipping test, 3-gate gap

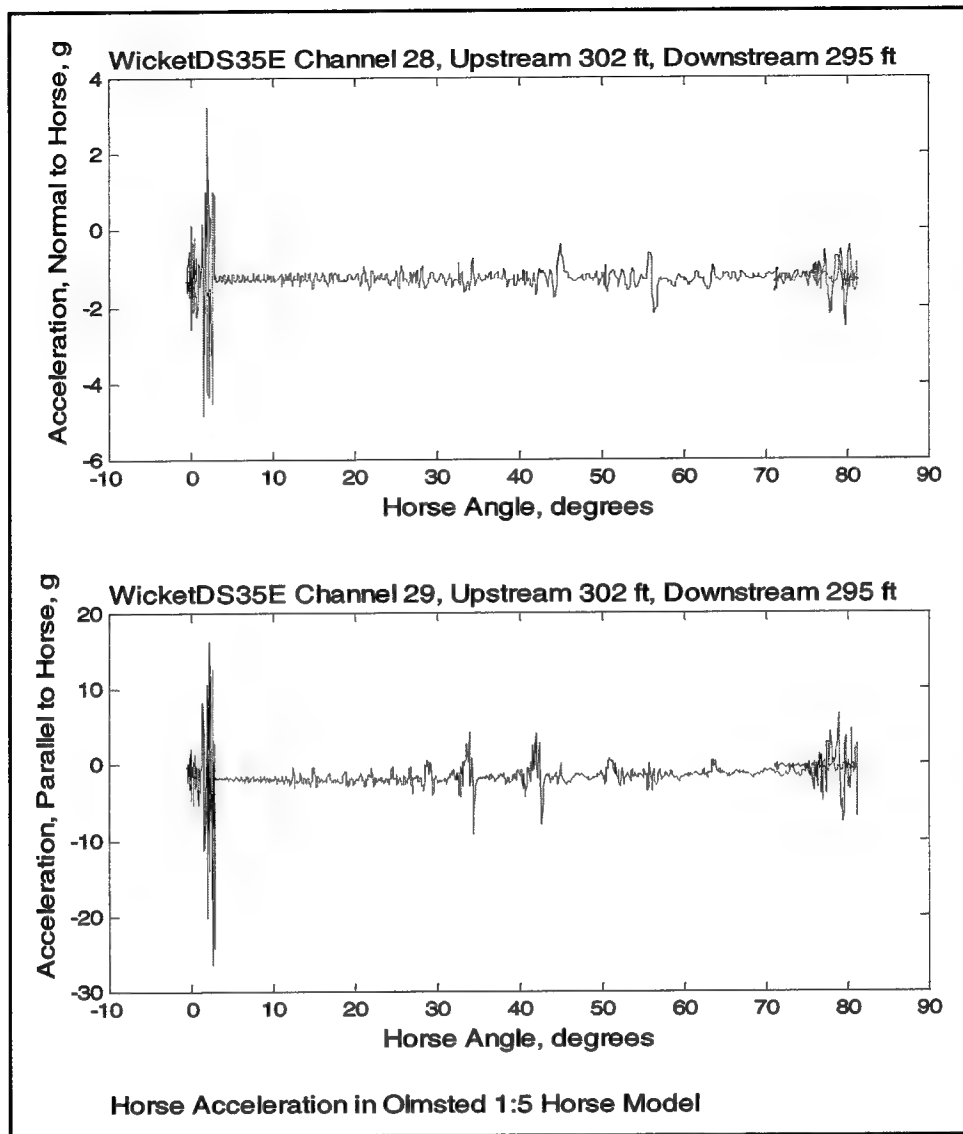


Figure 131. Horse acceleration – bottom-lift flipping test, 3-gate gap

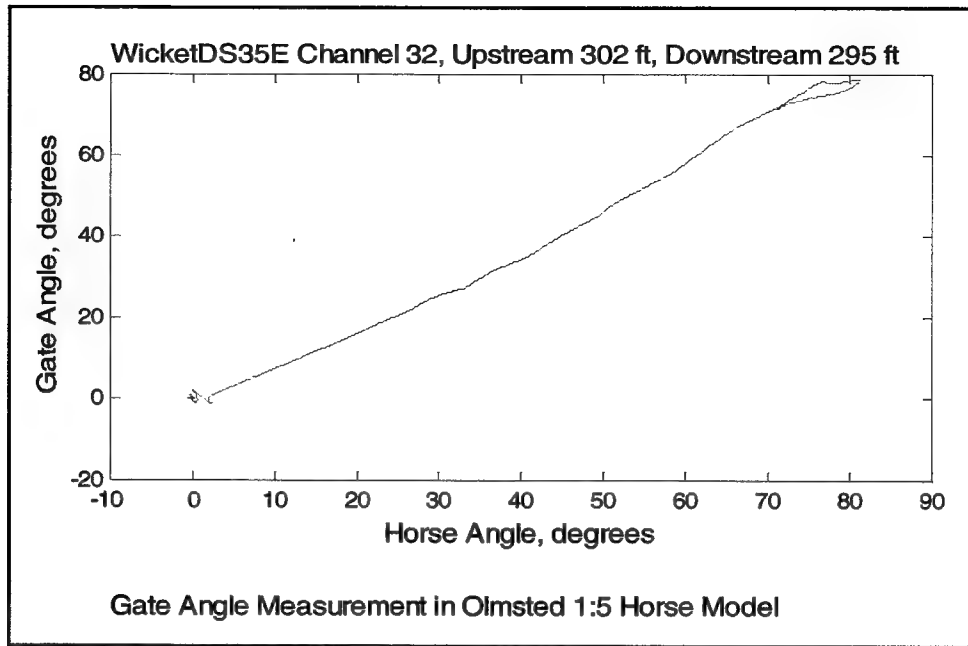


Figure 132. Gate and horse angle variation – bottom-lift flipping test, 3-gate gap

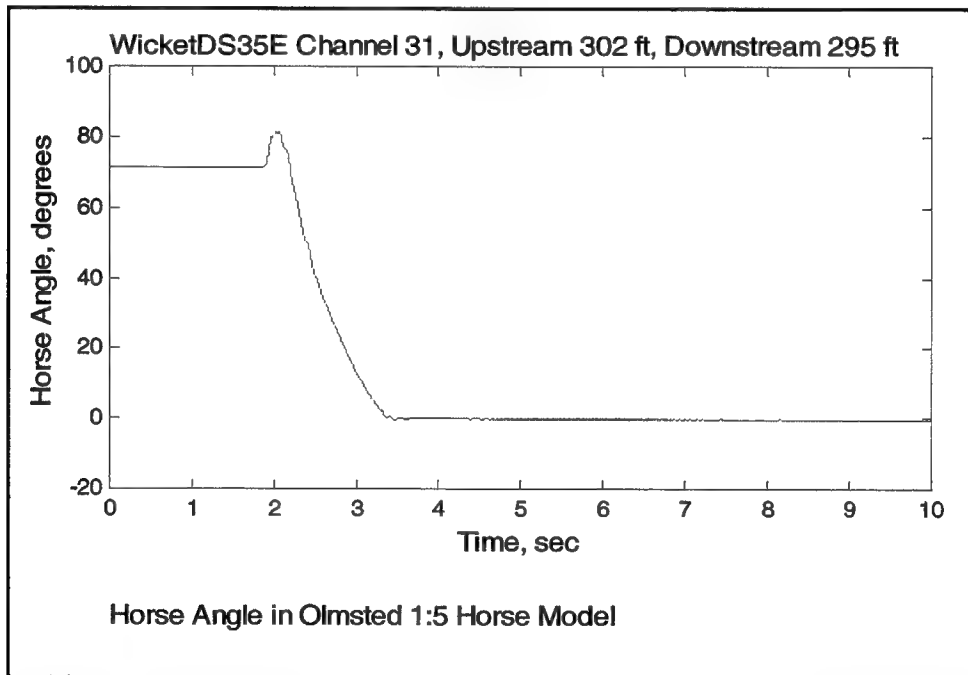


Figure 133. Horse angle variation as a function of time – bottom-lift flipping test, 3-gate gap



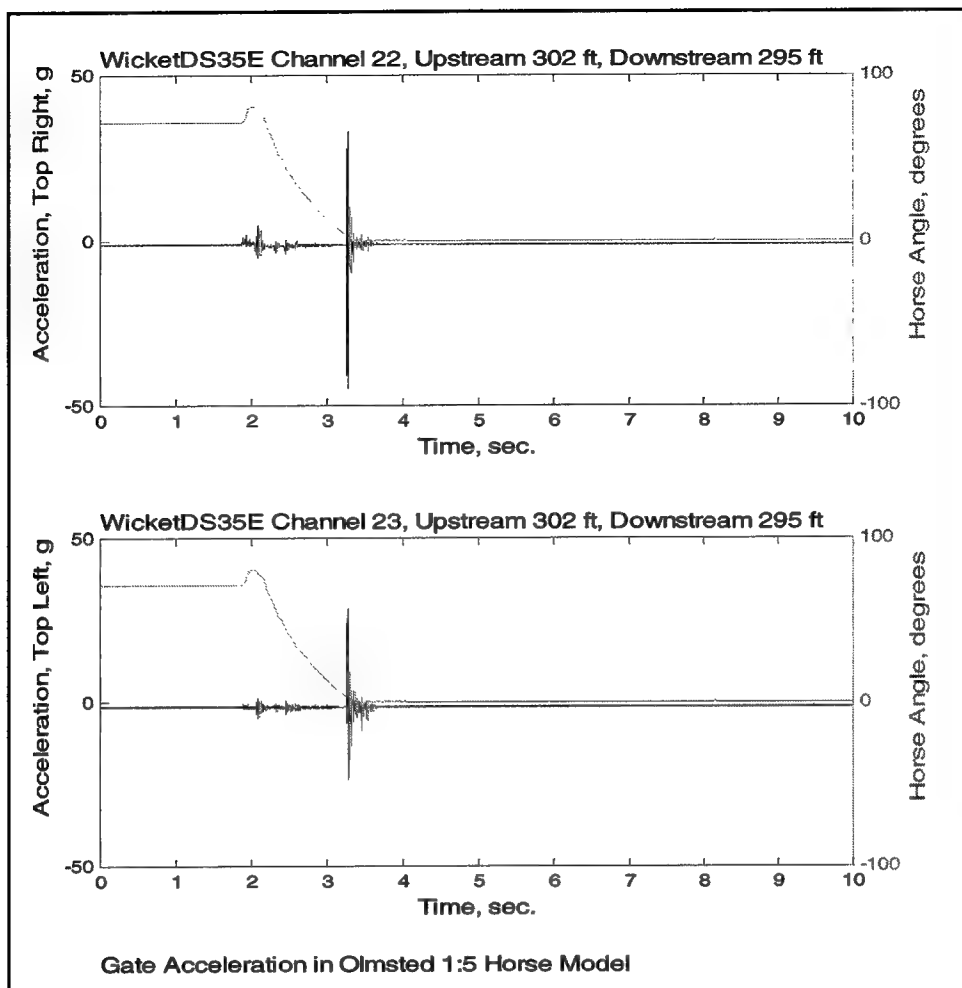


Figure 134. Gate acceleration as a function of time – bottom-lift flipping test, 3-gate gap

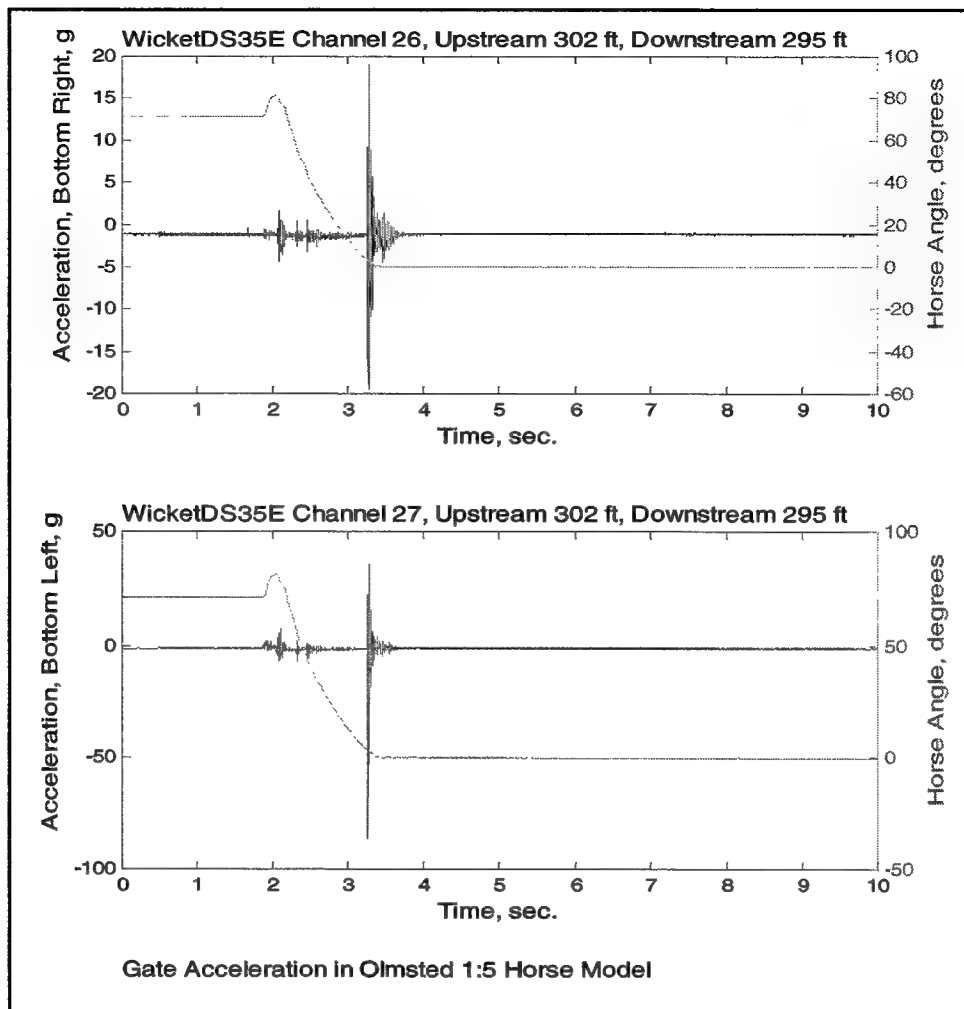


Figure 135. Gate acceleration as a function of time – bottom-lift flipping test, 3-gate gap

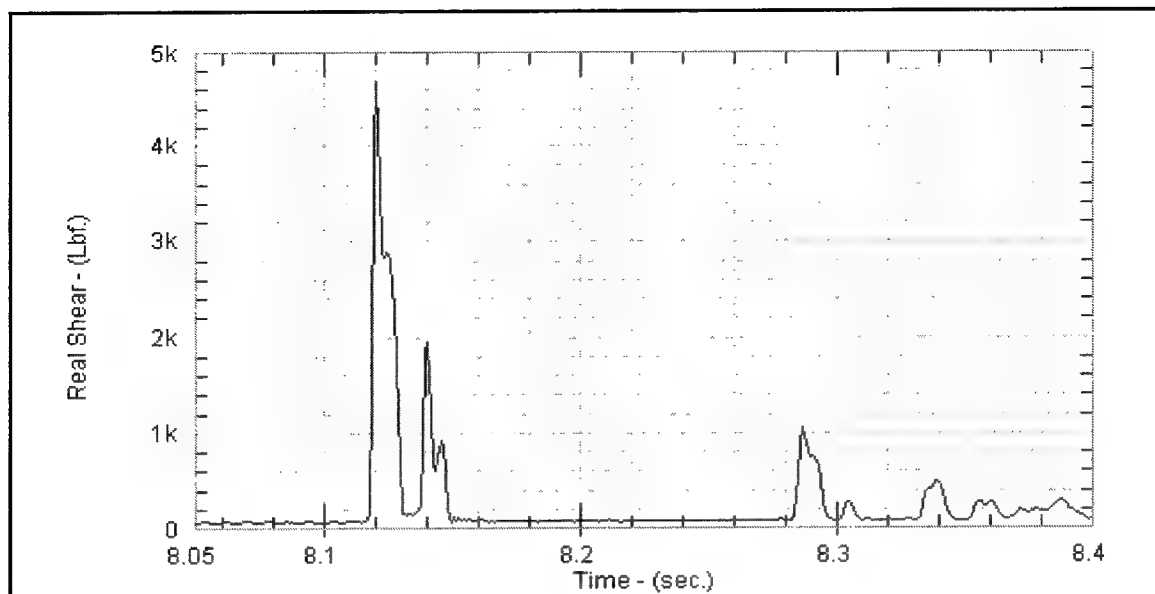


Figure 136. Bumper plate right shear based on shear strain bridge (test case Wicketus28e, pools: (298,295), no gate gap)

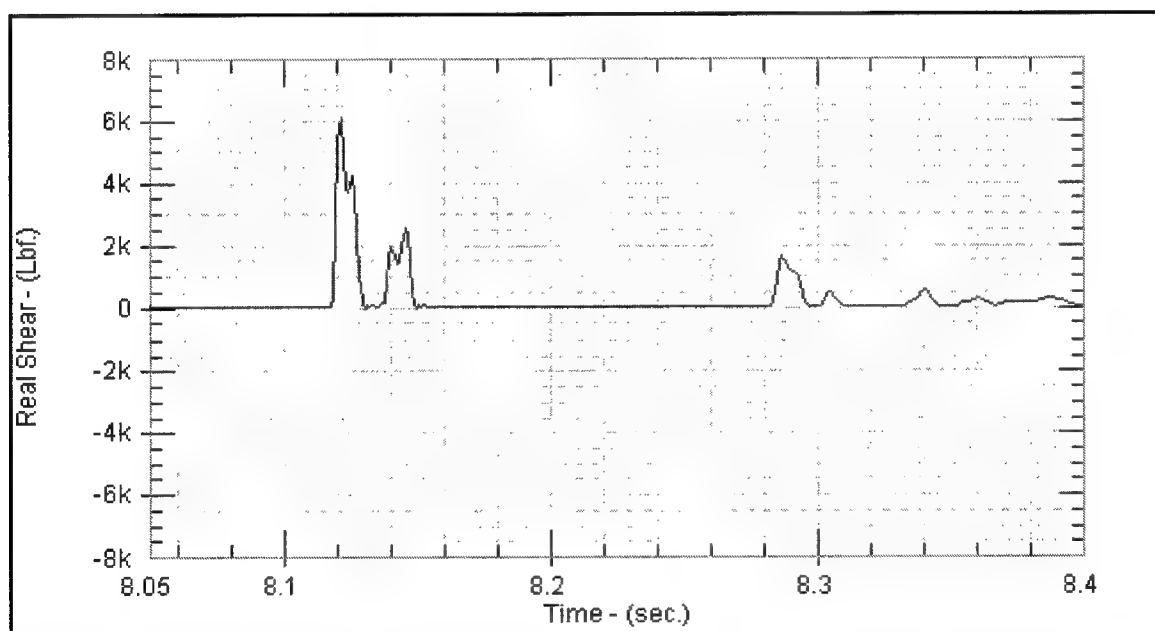


Figure 137. Bumper plate left shear based on shear strain bridge (test case Wicketus28e, pools: (298,295), no gate gap)

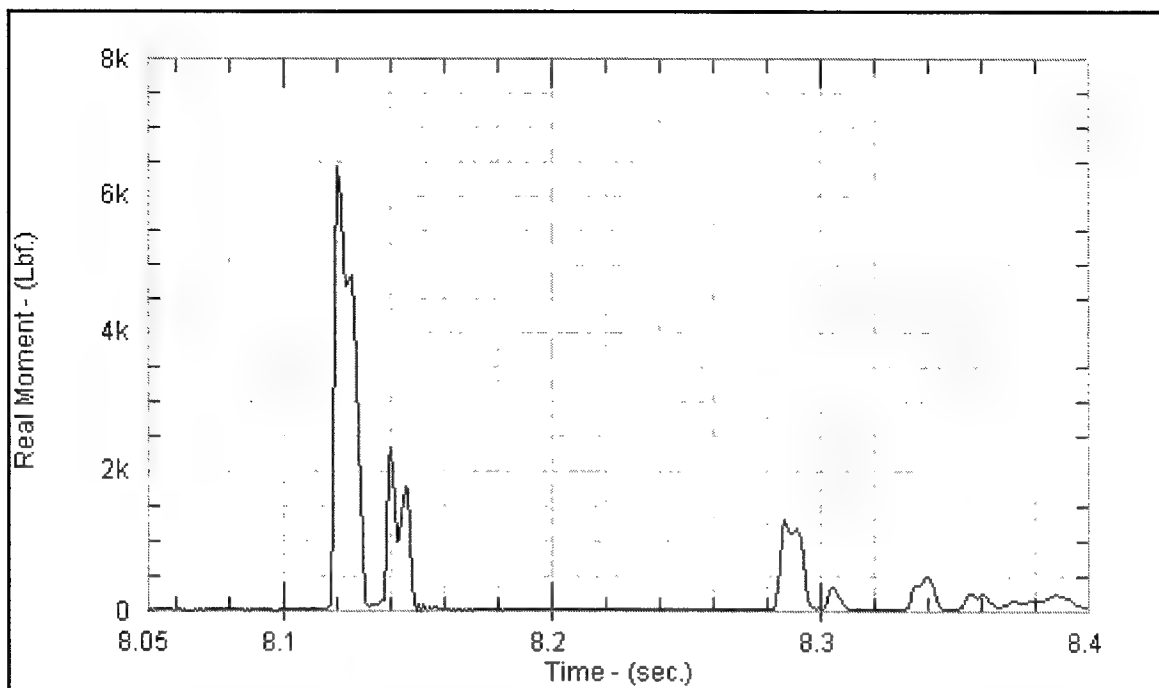


Figure 138. Bumper plate right shear based on bending moment bridge (test case Wicketus28e, pools: (298,295), no gate gap

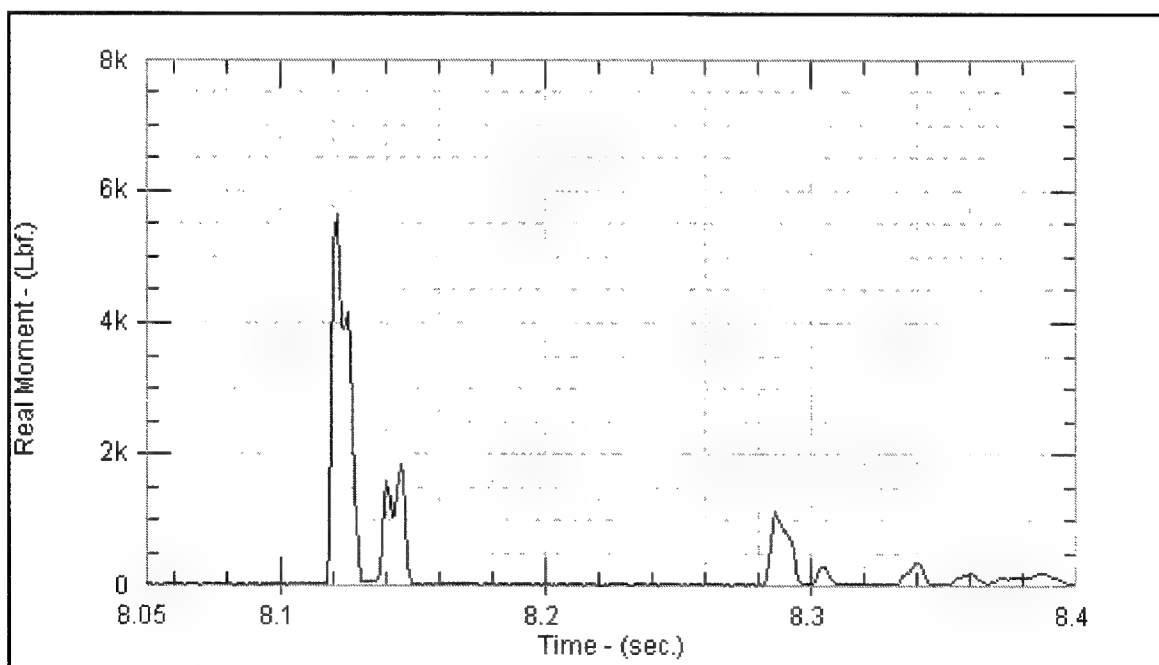


Figure 139. Bumper plate left shear based on bending moment bridge (test case Wicketus28e, pools: (298,295), no gate gap

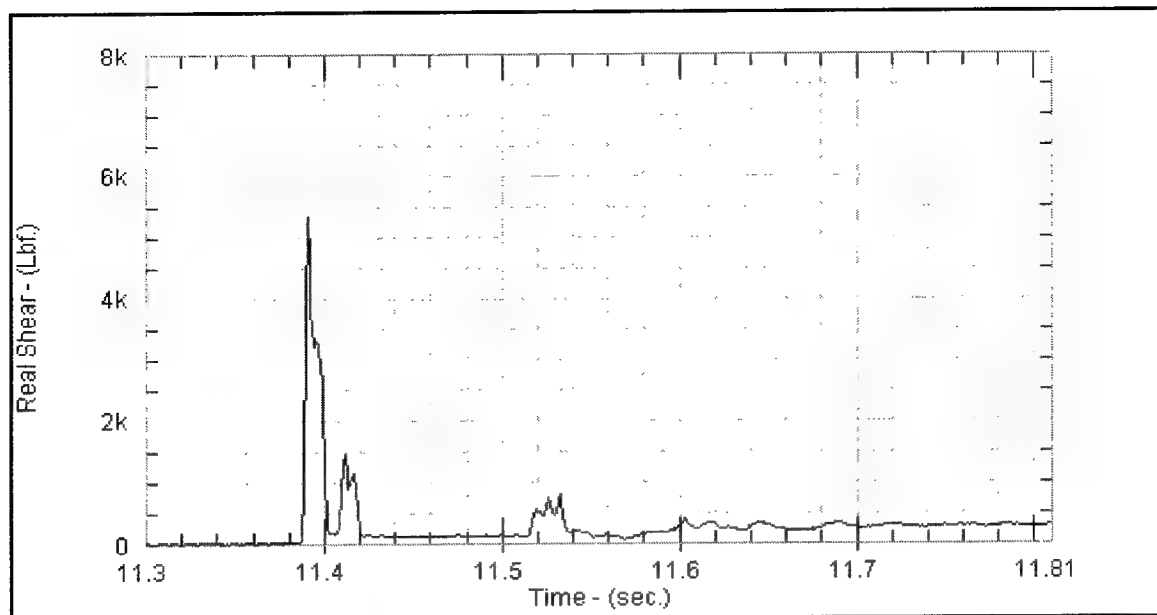


Figure 140. Bumper plate right shear based on shear strain bridge (test case Wicketus29a, pools: (300,295), no gate gap

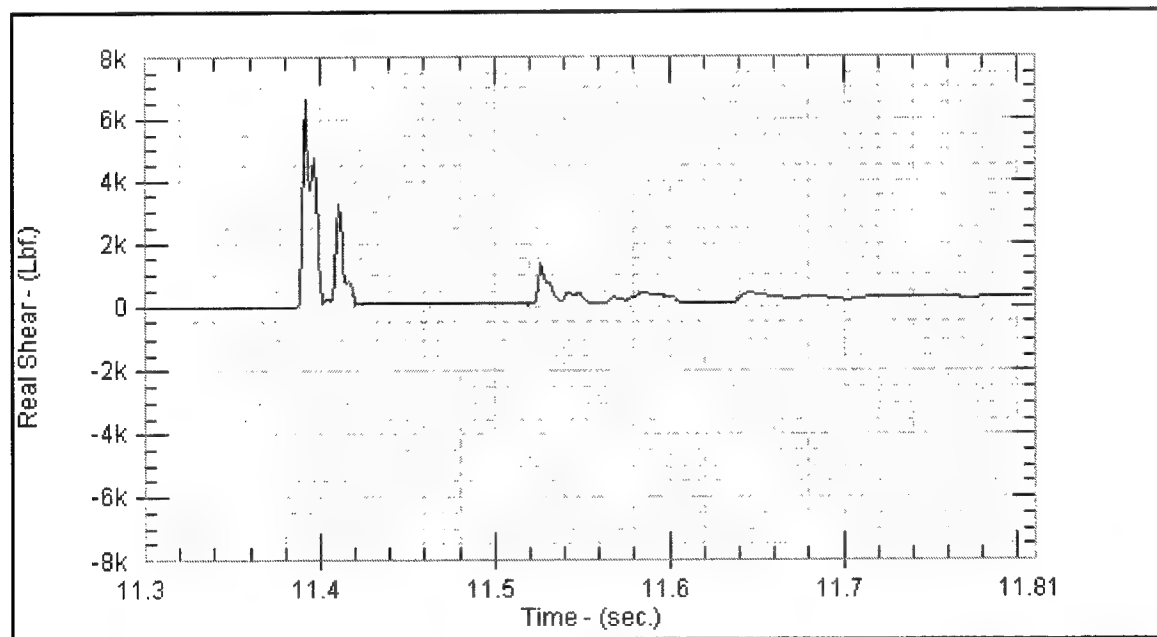


Figure 141. Bumper plate left shear based on shear strain bridge (test case Wicketus29a, pools: (300,295), no gate gap

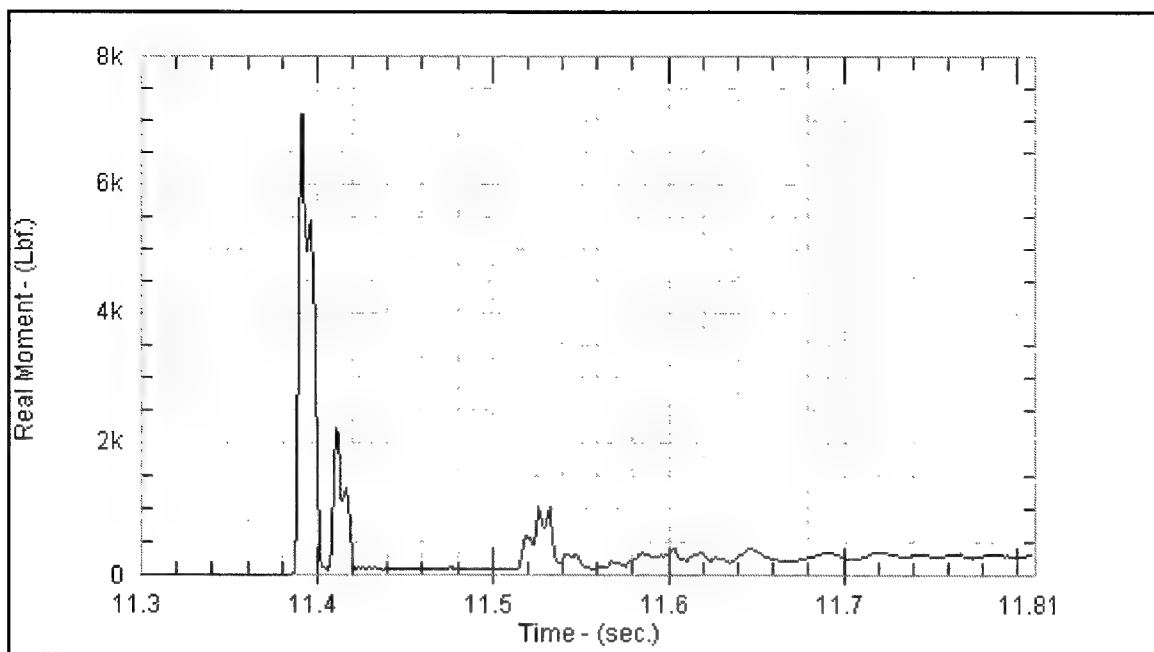


Figure 142. Bumper plate right shear based on moment bridge (test case Wicketus29a, pools: (300,295), no gate gap

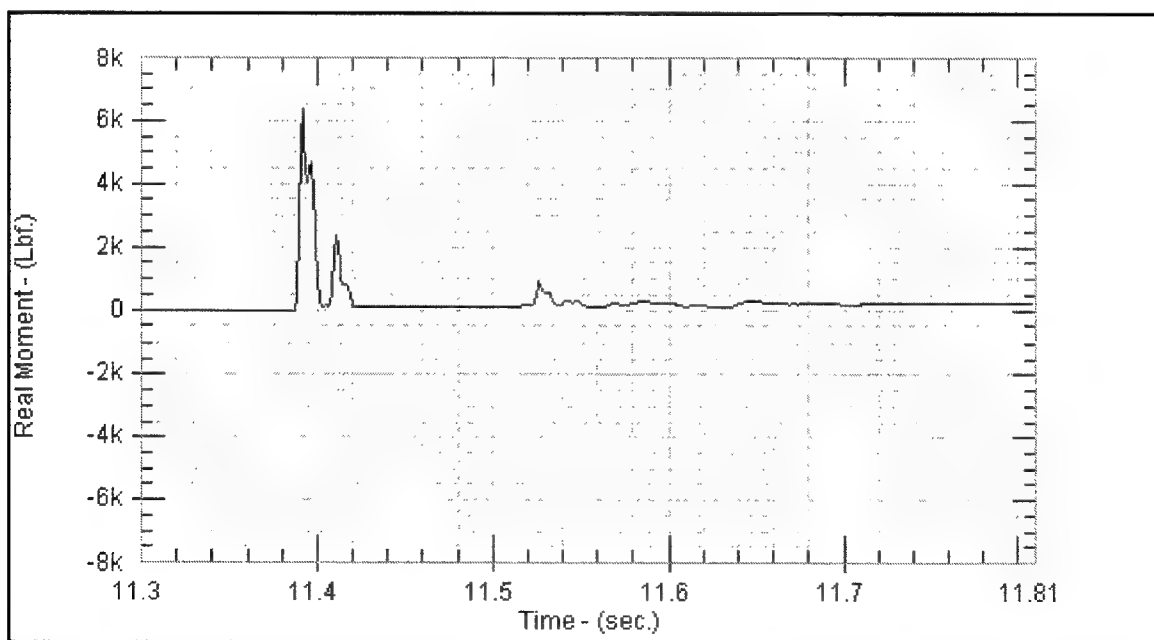


Figure 143. Bumper plate right shear based on moment bridge (test case Wicketus29a, pools: (300,295), no gate gap

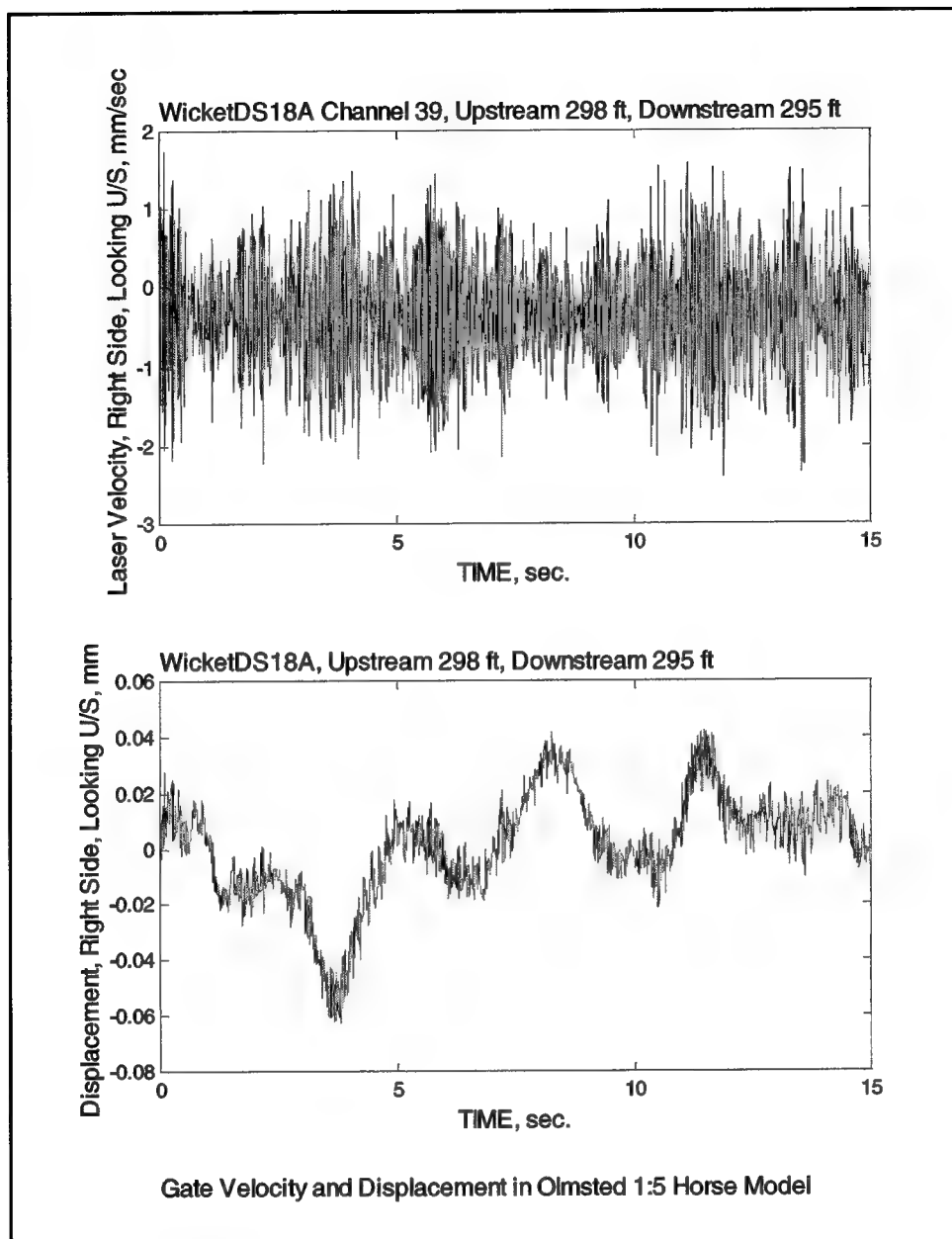


Figure 144. Gate top right corner velocity and displacement for 3-ft head differentials, 2-gate gap

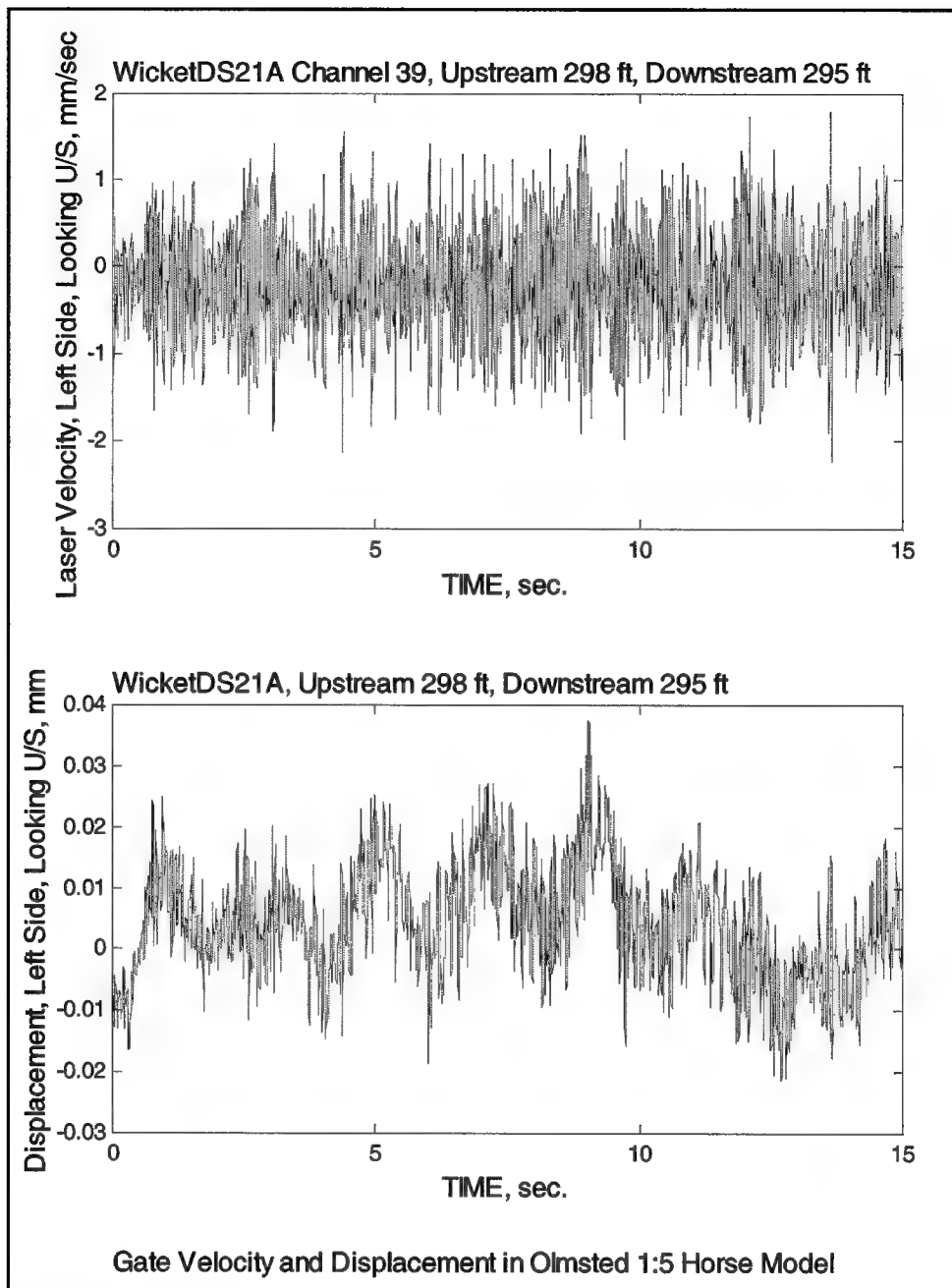


Figure 145. Gate top left corner velocity and displacement for 3-ft head differentials, 1-gate gap



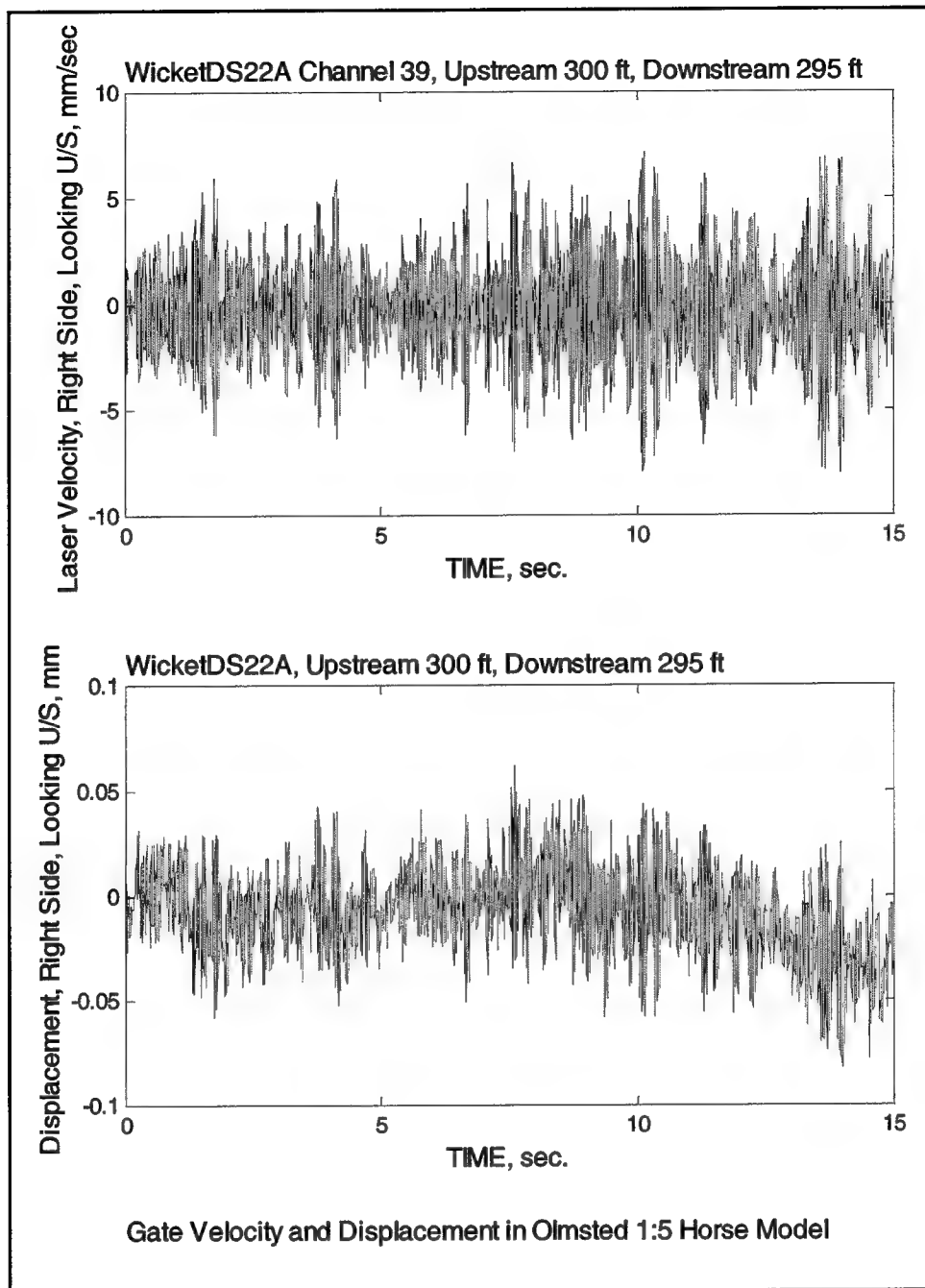


Figure 146. Gate top right corner velocity and displacement for 5-ft head differentials, 1-gate gap

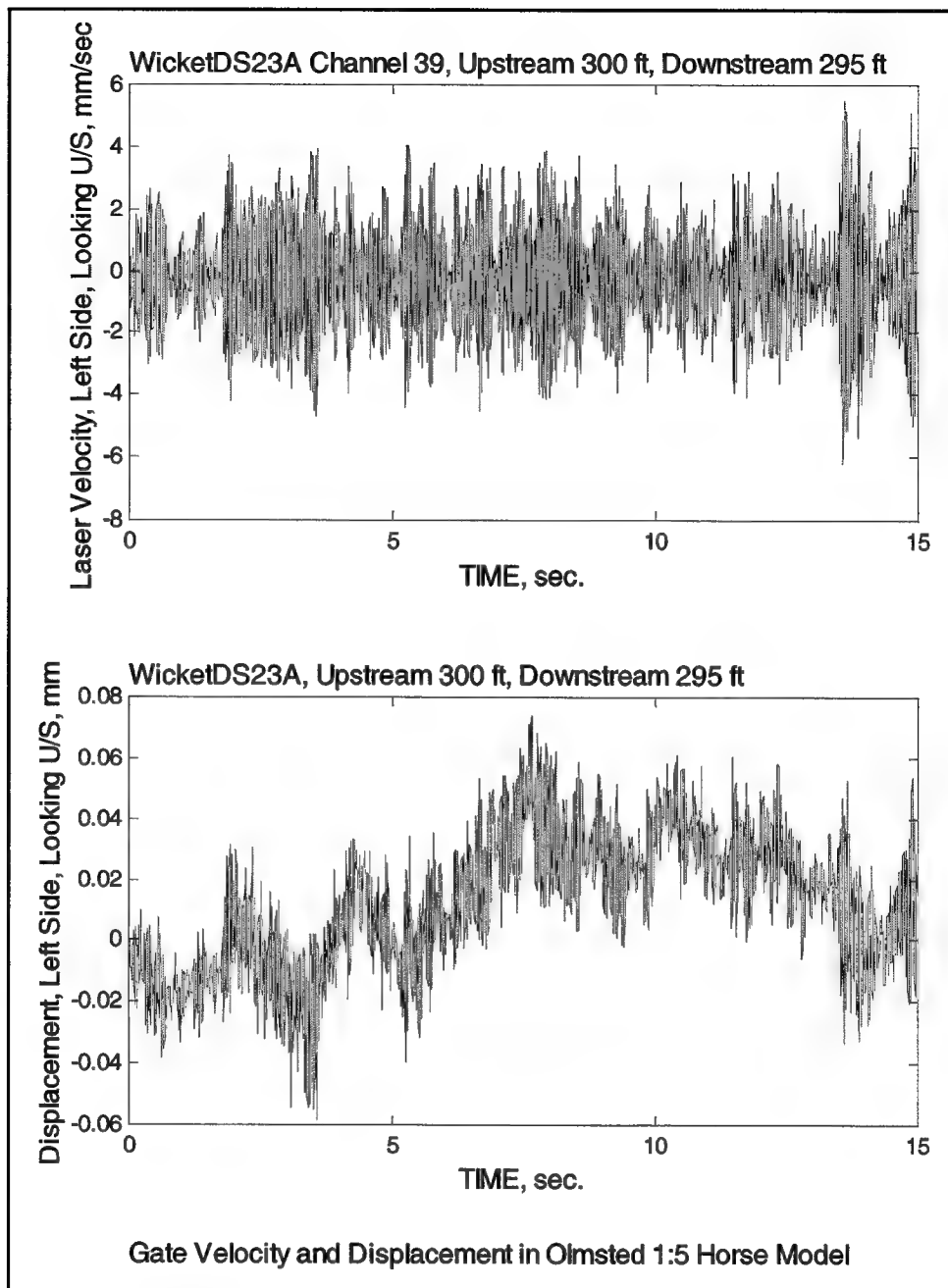


Figure 147. Gate top left corner velocity and displacement for 5-ft head differentials, 1-gate gap

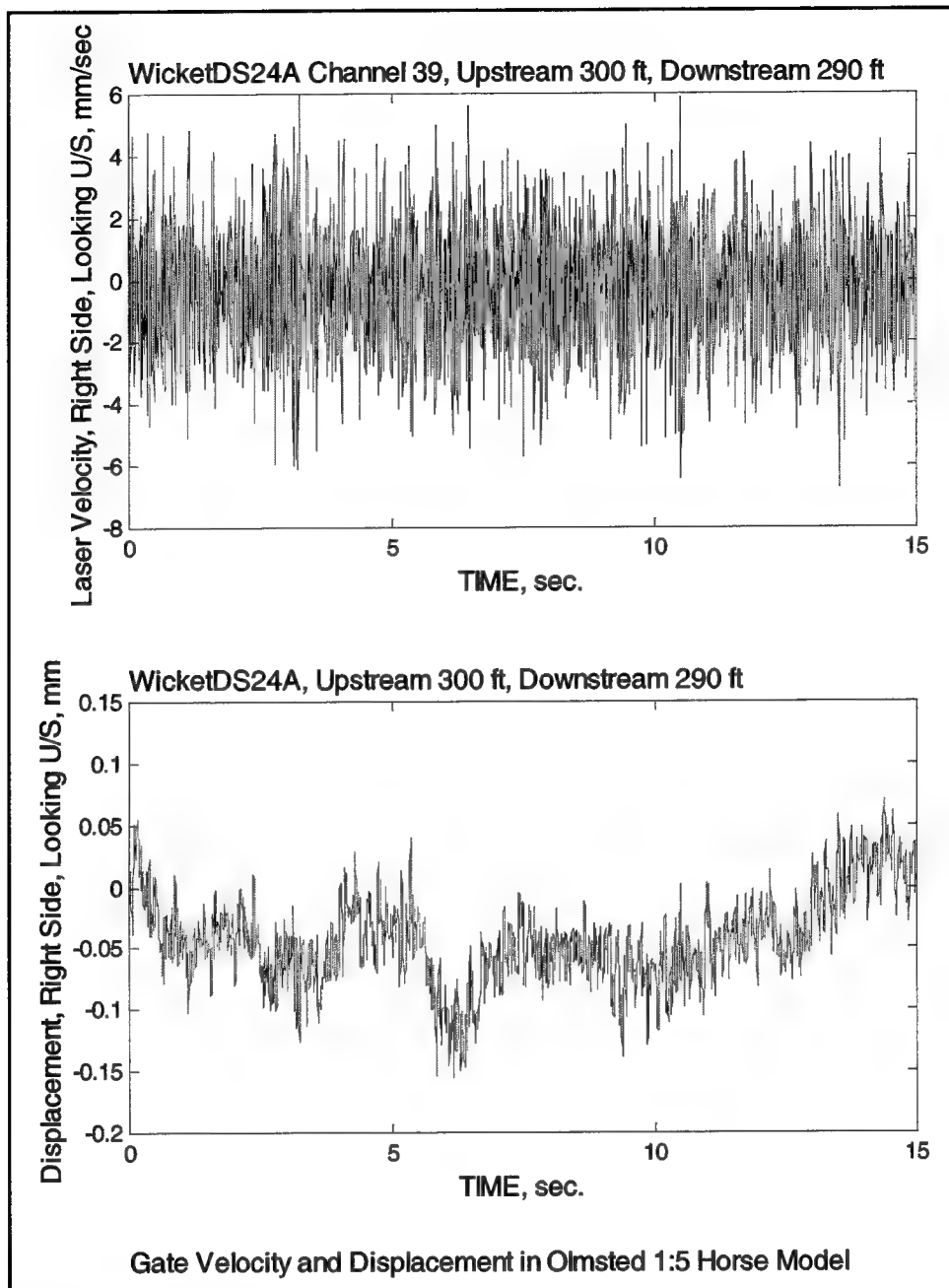


Figure 148. Gate top right corner velocity and displacement for 10-ft head differentials

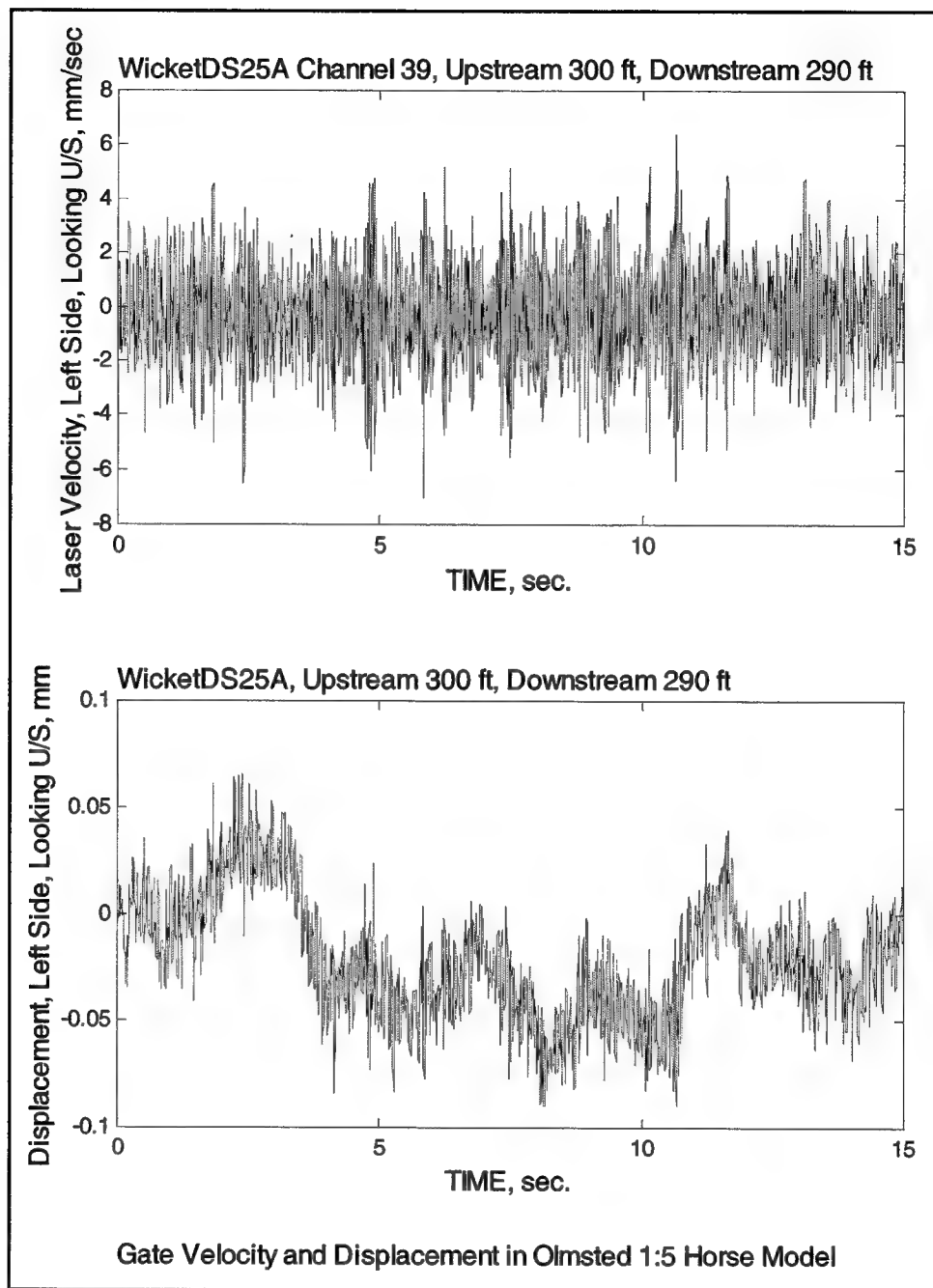


Figure 149. Gate top left corner velocity and displacement for 10-ft head differentials

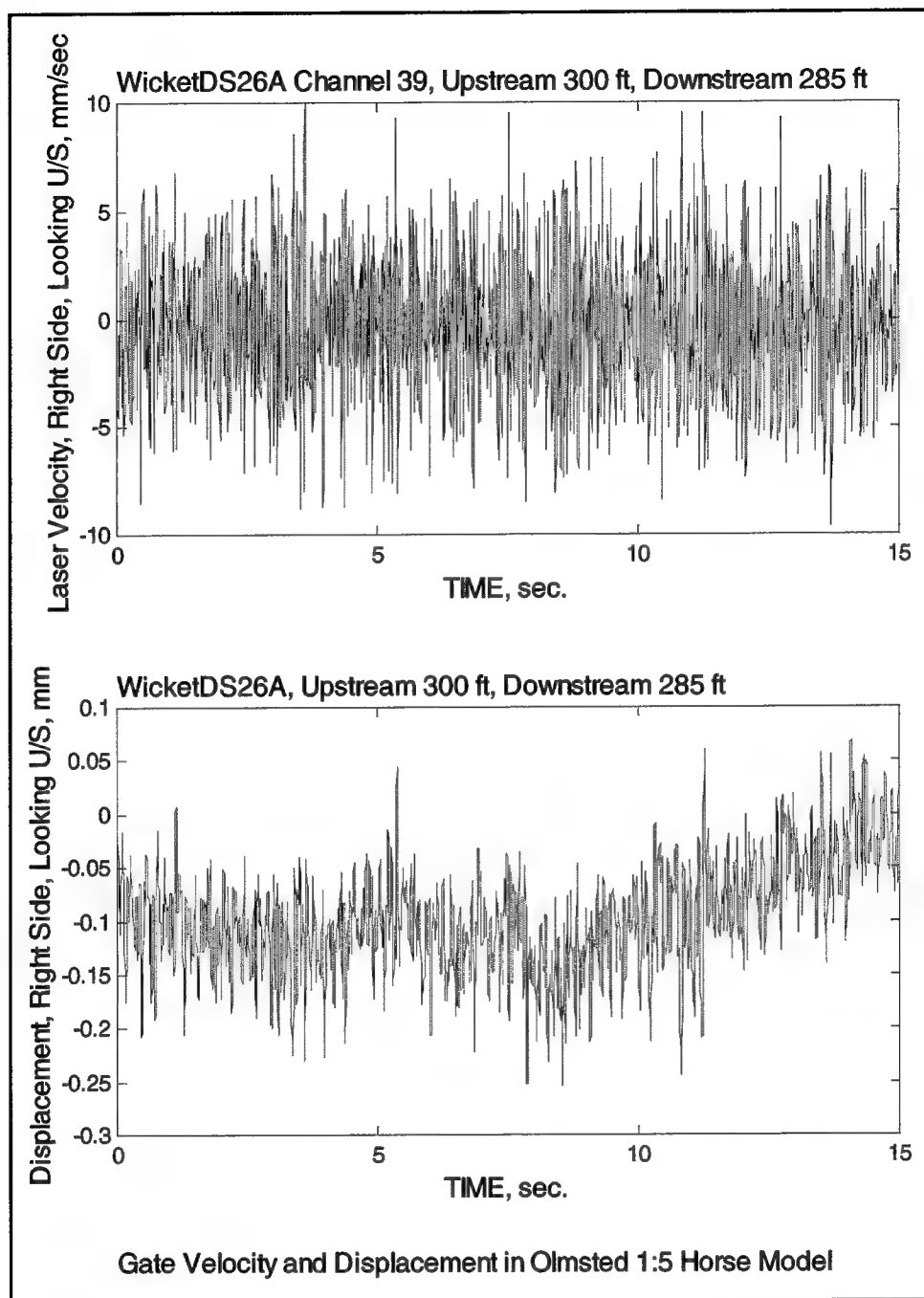


Figure 150. Gate top right corner velocity and displacement for 15-ft head differentials

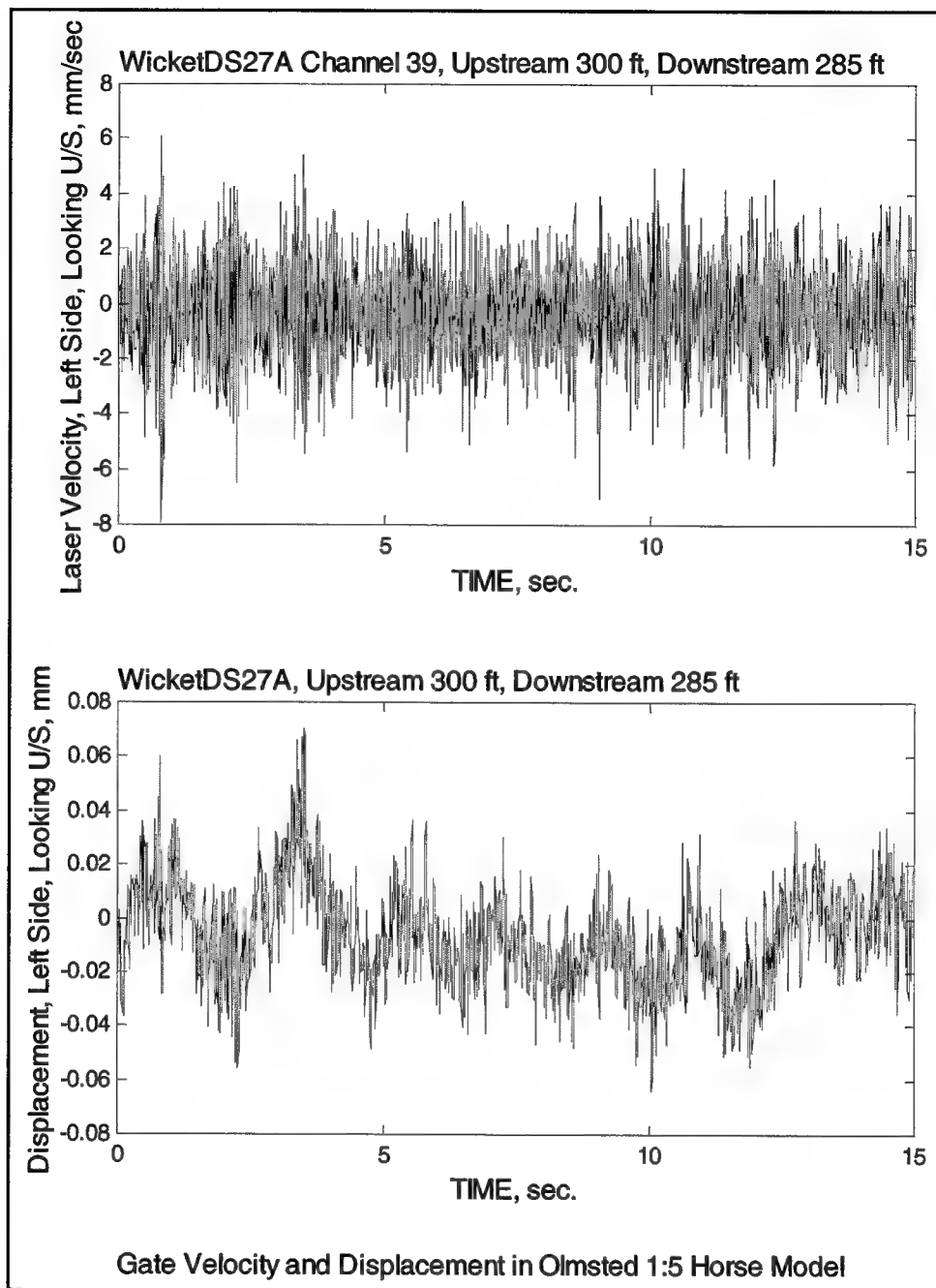
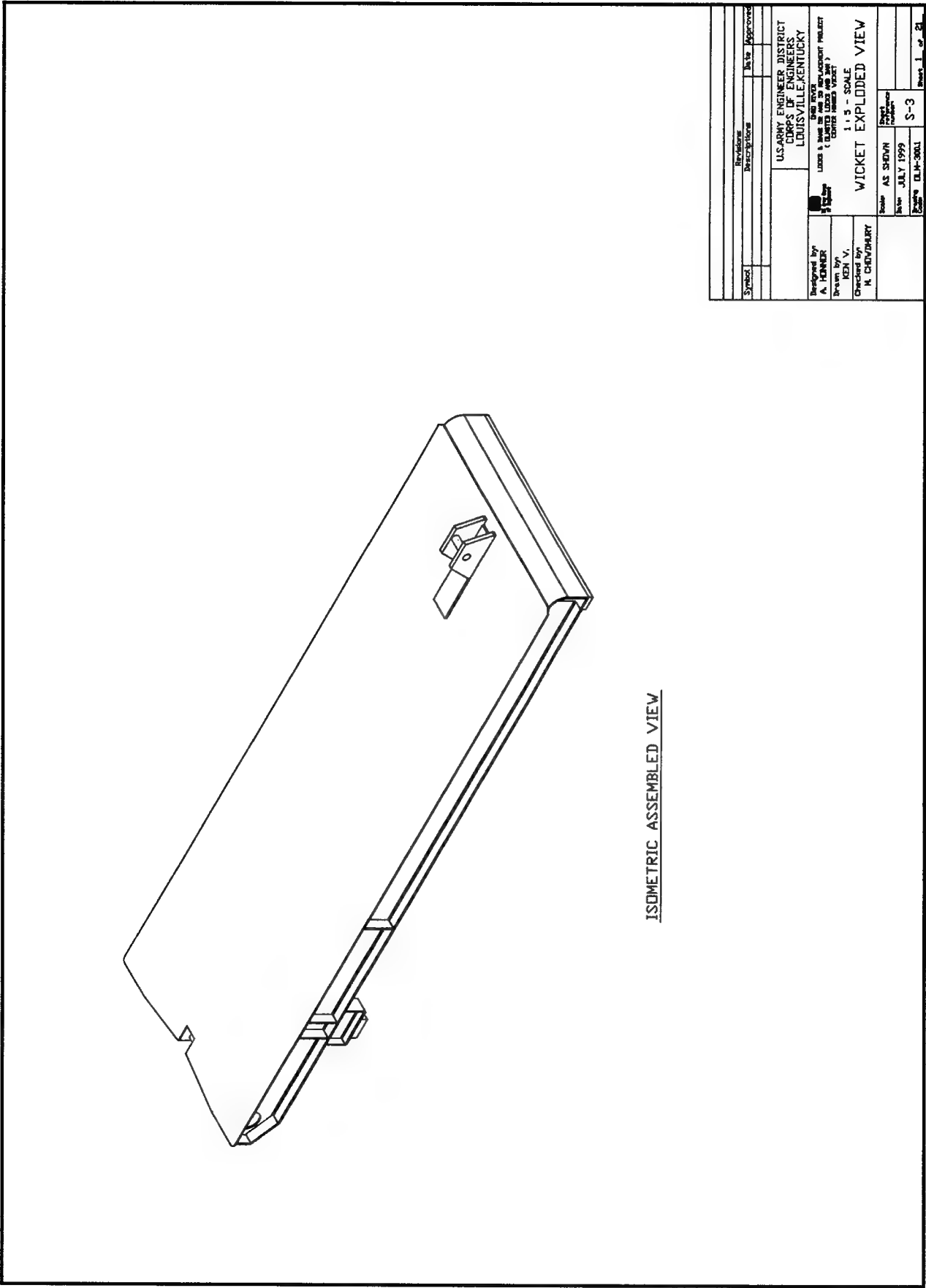


Figure 151. Gate top left corner velocity and displacement for 15-ft head differentials

# **Appendix A**

## **Shop Drawings**

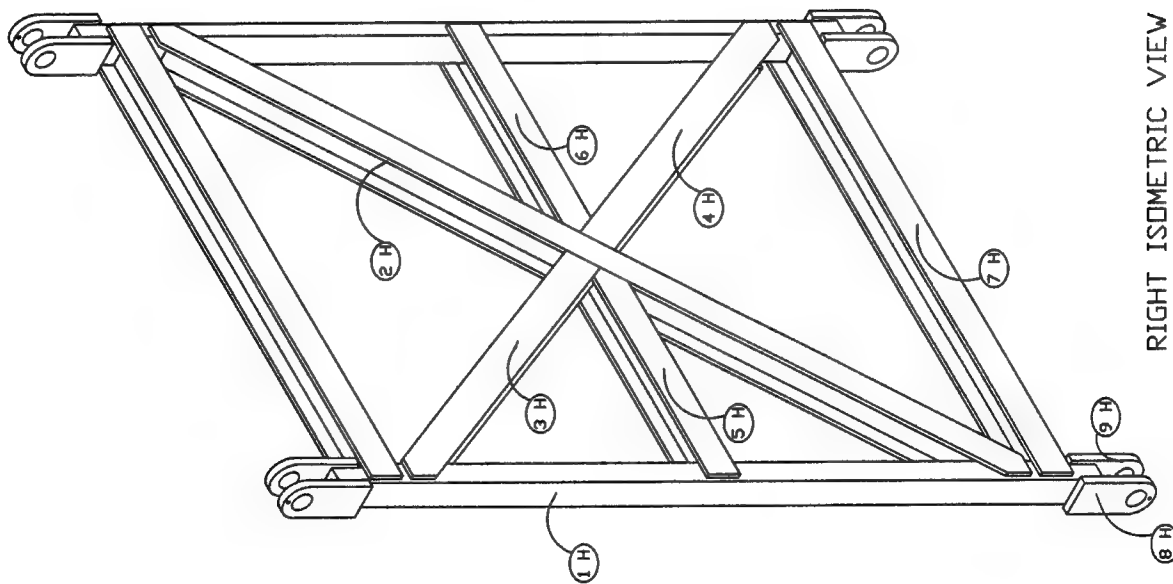
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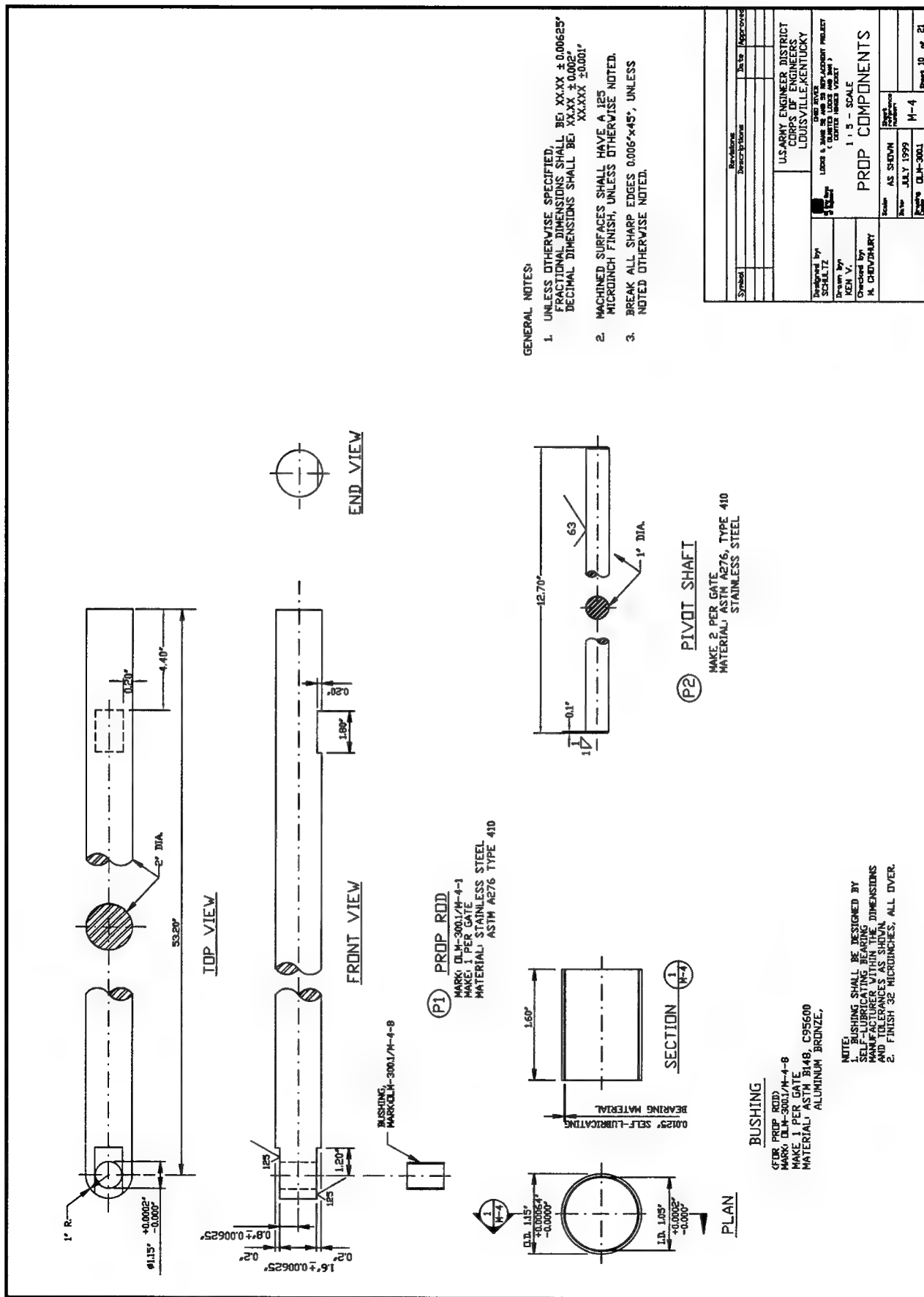
RIGHT ISOMETRIC VIEW

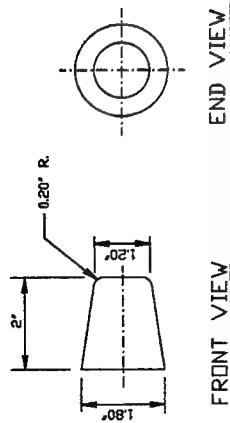
SCALE: NONE

Symbol	Revisions	Date	Approved
	Revised		
US ARMY ENGINEER DISTRICT CORPS OF ENGINEERS LOUISVILLE, KENTUCKY			
Drawn by KEVIN V. Checked by M. CHODHURY	Scale AS SHOWN	Date JULY 1999	Sheet S-4
LANCE & JAMES BE AND ASSOCIATES 115 S. SCALE CENTER HINGED WICKET HORSE & DETAILS			
Project Number DLH-3001		Sheet 7 of 21	

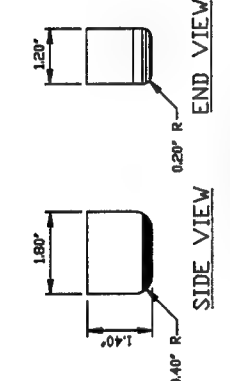




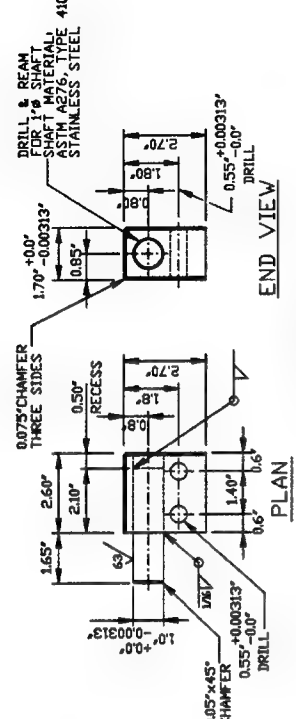




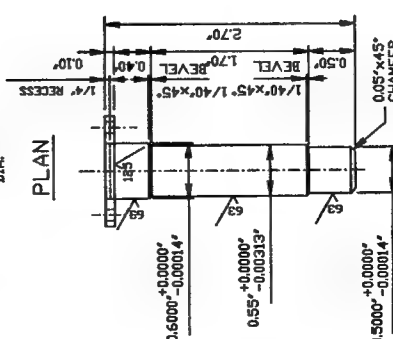
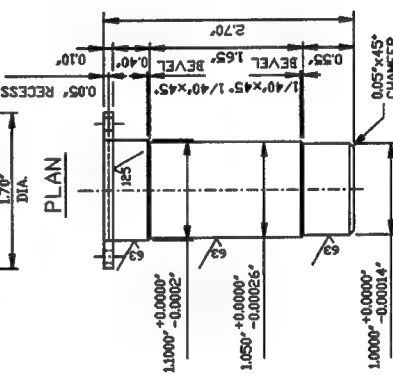
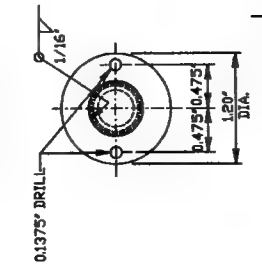
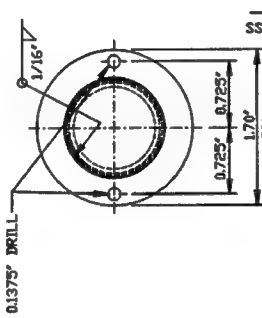
**PROP ROD EXTENSION**  
 MARK: DLH-3001/M-4-2  
 MAKE: 1 PER GATE  
 MATERIAL: ASTM A148 GRADE 105-85



**KICKER BLADE**  
 MARK: DLH-3001/M-4-3  
 MAKE: 1 PER GATE  
 MATERIAL: STRUCTURAL STEEL  
 ASTM A36



**PIVOT BLOCK**  
 MARK: DLH-3001/M-4-5  
 MAKE: 1 AS SHOWN & 1 OPPOSITE  
 HAND (PER GATE)  
 MATERIAL: STRUCTURAL STEEL,  
 ASTM A36



**ELEVATION**

**ELEVATION**

**PIVOT PIN**  
 MARK: DLH-3001/M-4-7  
 MAKE: 1 PER GATE  
 MATERIAL: ASTM A276, TYPE 410  
 STAINLESS STEEL

**LOCK PIN**  
 MARK: DLH-3001/M-4-6  
 MAKE: 1 PER GATE  
 MATERIAL: ASTM A276, TYPE 410  
 STAINLESS STEEL

**GENERAL NOTES:**

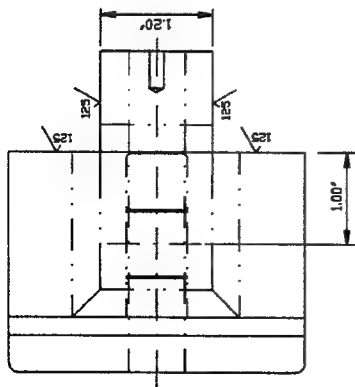
1. UNLESS OTHERWISE SPECIFIED, DIMENSIONS SHALL BE IN INCHES. DECIMAL DIMENSIONS SHALL BE XXXX ±0.001".
2. MACHINED SURFACES SHALL HAVE A 125 MICROINCH FINISH, UNLESS OTHERWISE NOTED.
3. BREAK ALL SHARP EDGES 0.006" X 45°, UNLESS NOTED OTHERWISE NOTED.

Symbol	Revision	Date	Applicable
US ARMY ENGINEER DISTRICT CORPS OF ENGINEERS LOUISVILLE, KENTUCKY			
Designed by	Checked by	Drawn by	Project
Reviewed by	Approved by	Scale	1:1.5 - SCALE
PROP COMPONENTS			
AS SHOWN	DATE	BY	NO.
JULY 1999	M-4		
DLH-3001			
Sheet 12 of 19			

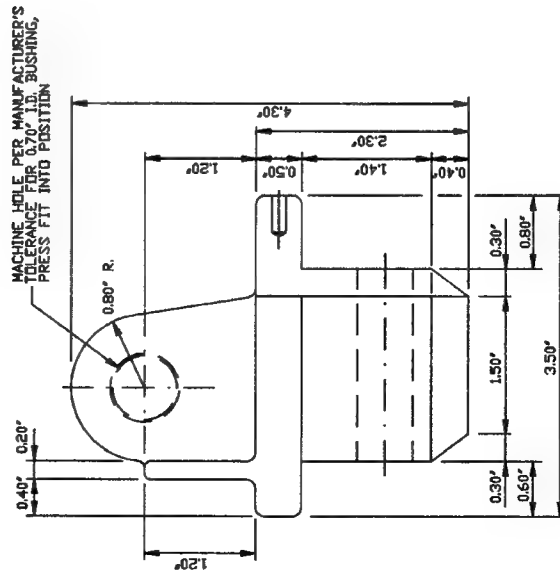




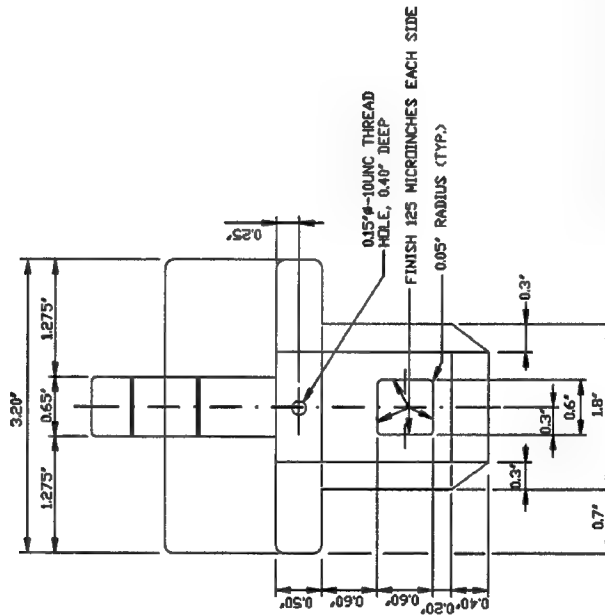




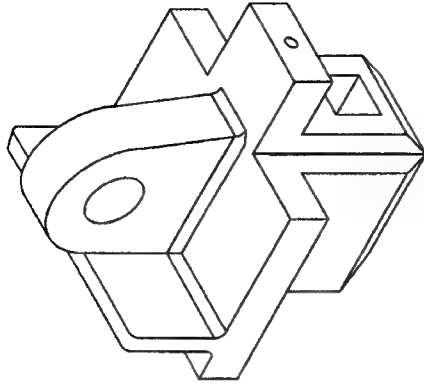
TOP VIEW



SIDE VIEW



END VIEW



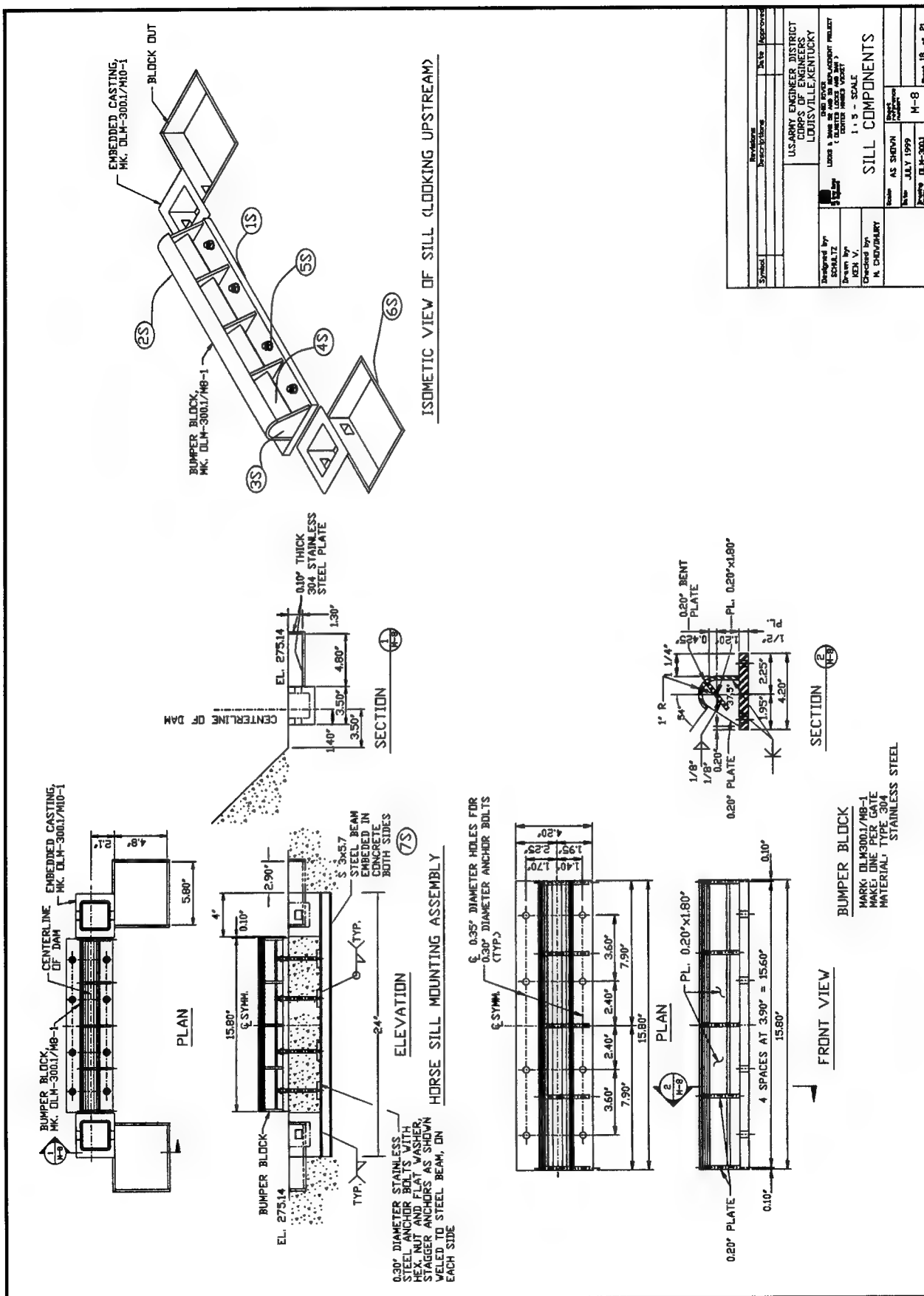
RIGHT ISOMETRIC VIEW

NOTE: HINGE CASTING IS DRAWN FOR RIGHT SIDE. IDENTICAL TYPE USED FOR LEFT SIDE WITH HOLE DRILLED ON OPPOSITE SIDE.


# HINGE CASTING

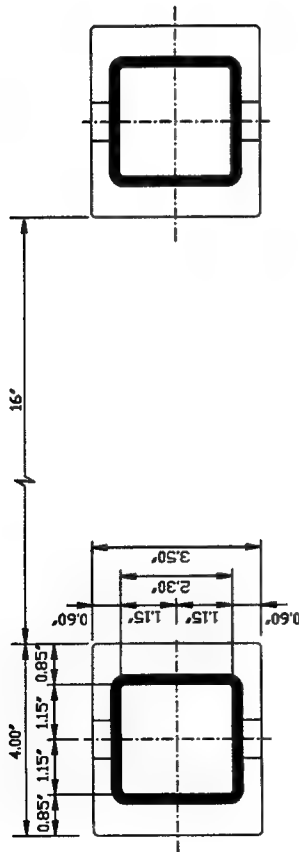
MARK: DLH-3001/N7-1  
MAKE: 2 EACH GATE  
MATERIAL: ASTM A276, TYPE 410  
STAINLESS STEEL, CONDITION A

Symbol	Revisions	Date	Appr
	DESCRIPTION		
DESIGNED BY: RICK SCHULTZ DRAWN BY: KEN V. CHECKED BY: M. CHOWHURY SCALE: 1:1 DATE: JULY 1999 SHEET: 17 of 21			
USARMY ENGINEER DISTRICT CORPS OF ENGINEERS LOUISVILLE, KENTUCKY HINGE CASTING DETAILS			

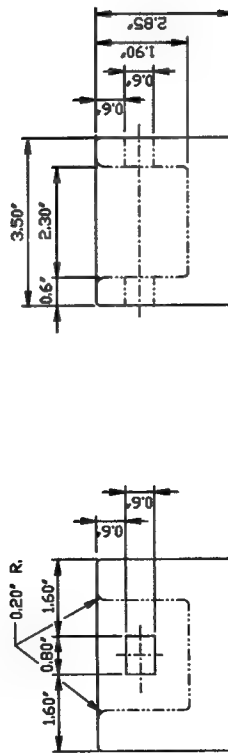




Designed by R. SCHULTZ		U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS LOUISVILLE, KENTUCKY	Buildings Drawings	DATE	APPROVED
Drawn by			LINES 1, 2 AND 3 ARE TO BE ADJACENT PARCELS 1. 100'x150' (EXISTING LOT) (SEE MAP) 1.5' - SCALE		
Checked by			SILL COMPONENT DETAILS		
Designed by H. CHANDURY			Scale AS SHOWN	Sheet Number	
Drawn by			Date JULY 1999	M-9	
Checked by			Drawn 04-10-2001		20

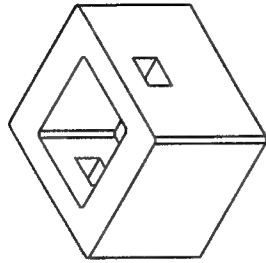


TOP VIEW



SIDE VIEW

END VIEW



RIGHT ISOMETRIC VIEW

# EMBEDDED CASTING

MARK: DLH-3001/M10-1  
 MAKE: 2  
 MATERIAL: ASTM A276, TYPE 410  
 STAINLESS STEEL, CONDITION A

NOTE:  
 UNLESS OTHERWISE NOTED,  
 BREAK ALL SHARP EDGES  
 WITH 0.10" RADIUS.

Symbol	Revisions	Drawn	Checked	Approved
DESIGNED BY: RICK SCHULTZ DRAWN BY: KEN W. CHECKED BY: N. CHANDRY SCALE: 1:5 EMBEDDED CASTING DETAILS				
US ARMY ENGINEER DISTRICT CORPS OF ENGINEERS LOUISVILLE, KENTUCKY			SCALE: AS SHOWN DATE: JULY 1999 PROJECT: M-10	
SHEET 21 OF 21				

# Appendix B

## Summary Test Statistics

### for 1:5-Scale Horse Wicket Experiments

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Item Number	Test Number	Page Number
1-3	Wicketds 1a-c	B2-B4
4-6	Wicketds 19 a-c	B5-B7
7-9	Wicketds 4 a-c	B8-B10
10-11	Wicketds 5 a,d	B11-B12
12-14	Wicketds 2 a-c	B13-B15
15-16	Wicketds 31 a-b	B16-B17
17-18	Wicketds 5 b-c	B18-B19
19-22	Wicketds 6 a-d	B20-B23
23-25	Wicketds 3 a-c	B24-B26
26-27	Wicketds 33 a-b	B27-B28
28-30	Wicketds 39 a-c	B29-B31
31-33	Wicketds 38 a-c	B32-B34
34-36	Wicketds 38 d-f	B35-B37
37-38	Wicketds 7 a-b	B38-B39
39-41	Wicketds 8 a-c	B40-B42
42-44	Wicketds 9 a-c	B43-B45
45-47	Wicketds 10 a-c	B46-B48
48-50	Wicketds 12 a-c	B49-B51
51-53	Wicketds 11 a-c	B52-B54
54-56	Wicketds 13 a-c	B55-B57
57	Wicketus 40 a	B58
58-61	Wicketus 14 a-c	B59-B61
62-64	Wicketus 41 a-c	B62-B64
65-68	Wicketus 15 a-c	B65-B67
69-71	Wicketus 42 a-c	B68-B70
72-77	Wicketus 28 a-f	B71-B76
78	Wicketus 29 a	B77
79	Wicketds 36 a	B78
80-82	Wicketds 34 a-c	B79-B81
83-87	Wicketds 35 a-e	B82-B86
88-90	Wicketds 20a-c	B87-B89
91-93	Wicketds 21 a-c	B90-B92
94-96	Wicketds 18 a-c	B93-B95
97-99	Wicketds 22 a-c	B96-B98
100-102	Wicketds 23 a-c	B99-B101
103-105	Wicketds 24 a-c	B102-B104
106-108	Wicketds 25 a-c	B105-B107
109-111	Wicketds 26 a-c	B108-B110
112-114	Wicketds 27 a-c	B111-B113

Information File Name: **wicketds1a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/10/00 8:58:46 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #1 Series 1 Condition A

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 295 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, single gate operation.

CHAN NUM	STATISTICS				ROOT MEAN SQUARE	ENGR UNITS	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION			
1	-15.735	6.187	33.831	5.737	8.437	Lbs.	LOAD PIN 3X
2	-17.610	22.277	143.283	10.733	24.728	Lbs.	LOAD PIN 3Y
3	-20.618	-1.534	38.063	14.115	14.198	Lbs.	LOAD PIN 4X
4	-16.512	44.949	144.676	13.407	46.906	Lbs.	LOAD PIN 4Y
5	-10.557	6.885	20.235	3.713	7.822	Lbs.	LOAD PIN 5X
6	-13.743	37.455	161.747	20.929	42.905	Lbs.	LOAD PIN 5Y
7	-40.628	-9.199	5.925	8.689	12.654	Lbs.	LOAD PIN 6X
8	-11.489	52.546	157.563	20.861	56.536	Lbs.	LOAD PIN 6Y
9	-45.022	26.472	86.879	9.080	27.985	Lbs.	LOAD PIN 1
10	-262.322	-27.072	8.958	14.981	30.941	LBS.	STRAIN GAGE S1
11	-112.866	-32.082	15.796	11.678	34.141	LBS.	STRAIN GAGE S2
12	-5.602	-0.942	2.698	0.604	1.119	MICRO-IN.	STRAIN S3
13	-14.787	8.579	21.294	6.624	10.838	MICRO-IN.	STRAIN S4A
14	-6.040	-2.587	17.637	1.808	3.156	MICRO-IN.	STRAIN S4B
15	-13.681	1.149	12.747	0.927	1.477	MICRO-IN.	STRAIN S5A
16	-3.282	-0.557	1.817	0.378	0.673	MICRO-IN.	STRAIN S5B
17	-8.707	3.446	10.941	3.242	4.731	MICRO-IN.	STRAIN S6A
18	-4.352	-1.452	2.359	1.532	2.111	MICRO-IN.	STRAIN S6B
19	-0.532	6.079	13.381	3.163	6.853	MICRO-IN.	STRAIN S7A
20	-4.300	-1.363	0.618	0.705	1.534	MICRO-IN.	STRAIN S7B
21	1.692	59.801	179.705	35.868	69.733	Lbs.	WINCH CABLE LOAD
22	-1.979	0.004	0.909	0.041	0.042	g.	TOP RIGHT ACC. A1
23	-1.105	0.008	0.466	0.023	0.025	g.	TOP LEFT ACC. A2
24	-0.257	-0.006	1.242	0.022	0.023	g.	MID. RIGHT ACC. A3
25	-0.357	0.005	0.924	0.019	0.019	g.	MID. LEFT ACC. A4
26	-1.291	0.023	0.557	0.030	0.038	g.	BOTTOM RIGHT ACC. A5
27	-1.827	0.017	1.148	0.043	0.046	g.	BOTTOM LEFT ACC. A6
28	-0.717	0.018	0.478	0.014	0.023	g.	HORSE ACC. A7X
29	-0.151	0.006	0.359	0.008	0.010	g.	HORSE ACC. A7Y
30	-0.925	0.009	0.928	0.030	0.031	g.	HORSE ACC. A7Z
31	0.082	39.089	66.928	22.399	45.052	Degrees	HORSE TILT-METER T1
32	0.008	38.841	65.889	22.299	44.786	Degrees	GATE TILT-METER T2
33	294.849	294.916	295.033	0.034	294.916	Ft. WATER	U/S POOL
34	294.832	294.948	295.067	0.043	294.948	Ft. WATER	D/S POOL
40	-0.051	0.020	0.103	0.018	0.026	Volts	P3X
41	-0.051	0.068	0.435	0.033	0.075	Volts	P3Y
42	-0.120	0.005	0.063	0.043	0.044	Volts	P4X
43	-0.056	0.140	0.520	0.042	0.146	Volts	P4Y
44	-0.056	-0.019	0.037	0.010	0.022	Volts	P5X
45	-0.029	0.088	0.320	0.047	0.100	Volts	P5Y
46	-0.120	-0.027	0.017	0.025	0.037	Volts	P6X
47	-0.034	0.156	0.510	0.062	0.168	Volts	P6Y
48	-37.608	-24.269	-17.386	5.433	24.870	Degrees	Winch cable angle

Information File Name: **wicketds1b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/10/00 9:04:49 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #1b Series 1 Condition A

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 295 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, single gate operation.

CHAN	STATISTICS					ROOT MEAN ENGR UNITS	TYPE OF GAGE
	MINIMUM	AVERAGE	MAXIMUM	STANDARD			
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-14.948	7.468	31.470	6.407	9.840	Lbs.	LOAD PIN 3X
2	-5.603	29.484	134.477	10.644	31.346	Lbs.	LOAD PIN 3Y
3	-19.032	0.723	39.649	13.684	13.703	Lbs.	LOAD PIN 4X
4	-11.794	44.721	134.454	12.741	46.500	Lbs.	LOAD PIN 4Y
5	-8.798	6.718	20.235	3.858	7.747	Lbs.	LOAD PIN 5X
6	-4.229	46.334	167.033	20.824	50.799	Lbs.	LOAD PIN 5Y
7	-41.475	-8.743	6.771	8.426	12.142	Lbs.	LOAD PIN 6X
8	-4.103	59.799	161.666	21.329	63.489	Lbs.	LOAD PIN 6Y
9	-26.179	26.583	70.549	9.606	28.266	Lbs.	LOAD PIN 1
10	-112.044	-28.637	8.958	14.186	31.958	LBS.	STRAIN GAGE S1
11	-110.887	-38.837	9.857	11.929	40.628	LBS.	STRAIN GAGE S2
12	-5.055	-0.902	2.059	0.594	1.081	MICRO-IN.	STRAIN S3
13	-13.056	8.188	20.656	6.317	10.342	MICRO-IN.	STRAIN S4A
14	-5.211	-1.724	4.278	1.699	2.420	MICRO-IN.	STRAIN S4B
15	-10.514	0.738	12.295	0.969	1.218	MICRO-IN.	STRAIN S5A
16	-3.282	-0.720	1.089	0.414	0.831	MICRO-IN.	STRAIN S5B
17	-7.251	3.329	10.577	3.116	4.560	MICRO-IN.	STRAIN S6A
18	-4.533	-1.827	1.724	1.471	2.346	MICRO-IN.	STRAIN S6B
19	-0.259	5.891	13.108	3.107	6.660	MICRO-IN.	STRAIN S7A
20	-3.845	-1.053	0.983	0.745	1.290	MICRO-IN.	STRAIN S7B
21	-11.576	59.374	180.811	35.711	69.286	Lbs.	WINCH CABLE LOAD
22	-2.321	0.005	0.756	0.037	0.037	g.	TOP RIGHT ACC. A1
23	-1.010	0.008	0.393	0.021	0.023	g.	TOP LEFT ACC. A2
24	-0.273	-0.006	0.866	0.020	0.021	g.	MID. RIGHT ACC. A3
25	-0.250	0.004	0.584	0.015	0.015	g.	MID. LEFT ACC. A4
26	-0.805	0.025	0.408	0.024	0.035	g.	BOTTOM RIGHT ACC. A5
27	-1.257	0.016	1.090	0.038	0.042	g.	BOTTOM LEFT ACC. A6
28	-0.678	0.018	0.333	0.012	0.022	g.	HORSE ACC. A7X
29	-0.220	0.006	0.399	0.008	0.010	g.	HORSE ACC. A7Y
30	-0.586	0.010	0.569	0.022	0.024	g.	HORSE ACC. A7Z
31	0.082	39.080	66.928	22.464	45.076	Degrees	HORSE TILT-METER T1
32	0.032	38.811	65.889	22.336	44.780	Degrees	GATE TILT-METER T2
33	294.864	294.972	295.094	0.051	294.972	Ft. WATER	U/S POOL
34	294.850	294.986	295.122	0.062	294.986	Ft. WATER	D/S POOL
40	-0.046	0.024	0.098	0.020	0.031	Volts	P3X
41	-0.020	0.090	0.388	0.032	0.095	Volts	P3Y
42	-0.122	-0.002	0.059	0.042	0.042	Volts	P4X
43	-0.039	0.139	0.476	0.040	0.144	Volts	P4Y
44	-0.056	-0.019	0.027	0.011	0.022	Volts	P5X
45	-0.005	0.108	0.334	0.047	0.118	Volts	P5Y
46	-0.122	-0.025	0.020	0.024	0.035	Volts	P6X
47	-0.012	0.178	0.522	0.063	0.189	Volts	P6Y
48	-38.471	-24.279	-17.312	5.571	24.910	Degrees	Winch cable angle



Information File Name: **wicketds1c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/10/00 9:08:40 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #1c Series 1 Condition A

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 295 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, single gate operation.

CHAN NUM	STATISTICS					ROOT MEAN ENGR UNITS SQUARE	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION			
1	-14.948	7.731	29.897	6.049		9.816 Lbs.	LOAD PIN 3X
2	-8.005	29.662	160.092	10.388		31.429 Lbs.	LOAD PIN 3Y
3	-21.411	-0.210	38.856	13.987		13.989 Lbs.	LOAD PIN 4X
4	-8.649	45.428	138.386	12.082		47.007 Lbs.	LOAD PIN 4Y
5	-12.317	6.158	21.115	3.508		7.087 Lbs.	LOAD PIN 5X
6	-6.343	45.947	168.090	21.073		50.549 Lbs.	LOAD PIN 5Y
7	-40.628	-9.300	5.925	8.220		12.412 Lbs.	LOAD PIN 6X
8	-2.462	61.168	160.846	20.720		64.582 Lbs.	LOAD PIN 6Y
9	-36.229	26.777	89.392	9.238		28.326 Lbs.	LOAD PIN 1
10	-139.368	-27.475	10.910	13.937		30.808 LBS.	STRAIN GAGE S1
11	-114.845	-38.686	1.940	10.933		40.201 LBS.	STRAIN GAGE S2
12	-5.146	-0.900	2.424	0.604		1.083 MICRO-IN.	STRAIN S3
13	-11.233	8.294	21.476	6.398		10.475 MICRO-IN.	STRAIN S4A
14	-5.395	-1.770	4.002	1.740		2.482 MICRO-IN.	STRAIN S4B
15	-8.251	0.823	11.571	1.069		1.349 MICRO-IN.	STRAIN S5A
16	-3.646	-0.688	1.180	0.445		0.819 MICRO-IN.	STRAIN S5B
17	-8.252	3.379	11.396	3.259		4.695 MICRO-IN.	STRAIN S6A
18	-4.714	-1.775	1.814	1.493		2.319 MICRO-IN.	STRAIN S6B
19	0.105	5.928	13.926	3.176		6.725 MICRO-IN.	STRAIN S7A
20	-6.486	-1.087	0.801	0.745		1.317 MICRO-IN.	STRAIN S7B
21	9.431	60.052	189.656	35.869		69.949 Lbs.	WINCH CABLE LOAD
22	-2.376	0.005	0.839	0.037		0.037 g.	TOP RIGHT ACC. A1
23	-0.868	0.008	0.273	0.020		0.021 g.	TOP LEFT ACC. A2
24	-0.446	-0.006	0.824	0.020		0.021 g.	MID. RIGHT ACC. A3
25	-0.337	0.004	0.672	0.016		0.016 g.	MID. LEFT ACC. A4
26	-0.764	0.024	0.674	0.024		0.034 g.	BOTTOM RIGHT ACC. A5
27	-1.313	0.017	1.098	0.036		0.040 g.	BOTTOM LEFT ACC. A6
28	-0.580	0.018	0.315	0.011		0.021 g.	HORSE ACC. A7X
29	-0.216	0.006	0.393	0.009		0.011 g.	HORSE ACC. A7Y
30	-0.580	0.010	0.494	0.021		0.023 g.	HORSE ACC. A7Z
31	0.082	39.610	66.978	22.399		45.505 Degrees	HORSE TILT-METER T1
32	0.008	39.334	65.889	22.267		45.200 Degrees	GATE TILT-METER T2
33	294.971	295.044	295.140	0.028		295.044 Ft. WATER	U/S POOL
34	294.959	295.061	295.176	0.033		295.061 Ft. WATER	D/S POOL
40	-0.046	0.024	0.093	0.019		0.031 Volts	P3X
41	-0.022	0.090	0.464	0.032		0.096 Volts	P3Y
42	-0.120	0.000	0.066	0.043		0.043 Volts	P4X
43	-0.034	0.141	0.481	0.038		0.146 Volts	P4Y
44	-0.056	-0.017	0.034	0.010		0.020 Volts	P5X
45	-0.010	0.107	0.366	0.048		0.117 Volts	P5Y
46	-0.117	-0.027	0.017	0.024		0.036 Volts	P6X
47	-0.007	0.182	0.515	0.062		0.192 Volts	P6Y
48	-37.829	-24.104	-17.041	5.328		24.686 Degrees	Winch cable angle

Information File Name: **wicketds19a.inf**  
 Sample Rate: 250.000 samples/sec/channel  
 Length of Time Recorded: 00:00:40.00  
 Data Collected on 8/3/00 2:50:41 PM  
 Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test  
 \*\*\* TEST #19a Series 1 Condition A 8/3/00  
 Balance and calibrated with wicket gate resting at 0 degrees  
 Winch cable, hooked to bottom of gate( u/s end )  
 Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass  
 Gate #6 @ raise gate 0 to 65 degrees  
 \*\*\* POOL ELEVATIONS: 295 ft. Head water & 295 ft. Tail water  
 \*\*\* TEST CONDITION: wet, gate open 1,2,7,8,12 , no flow test

CHAN NUM	STATISTICS					ENGR UNITS	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION	ROOT MEAN SQUARE		
1	-34.224	-25.244	5.901	8.566	26.658	Lbs.	LOAD PIN 3X
2	-30.418	41.725	148.486	14.668	44.229	Lbs.	LOAD PIN 3Y
3	-34.891	13.369	60.663	29.079	32.005	Lbs.	LOAD PIN 4X
4	-27.127	47.767	119.122	16.550	50.552	Lbs.	LOAD PIN 4Y
5	-6.159	21.171	42.230	3.447	21.449	Lbs.	LOAD PIN 5X
6	-50.216	53.637	169.147	19.265	56.992	Lbs.	LOAD PIN 5Y
7	-60.096	-26.842	-3.809	8.104	28.039	Lbs.	LOAD PIN 6X
8	-29.543	41.440	146.484	21.429	46.652	Lbs.	LOAD PIN 6Y
9	-661.591	15.408	55.189	17.800	23.542	Lbs.	LOAD PIN 1
10	-146.188	-25.142	48.569	14.913	29.232	LBS.	STRAIN GAGE S1
11	-114.745	-31.912	21.387	10.756	33.676	LBS.	STRAIN GAGE S2
12	-3.838	-0.793	2.080	0.507	0.941	MICRO-IN.	STRAIN S3
13	-6.733	9.064	23.989	5.270	10.485	MICRO-IN.	STRAIN S4A
14	-5.313	-1.359	6.707	1.449	1.986	MICRO-IN.	STRAIN S4B
15	-18.763	-0.235	8.773	4.286	4.293	MICRO-IN.	STRAIN S5A
16	-2.899	-0.303	8.603	1.272	1.307	MICRO-IN.	STRAIN S5B
17	-26.308	1.262	9.625	4.268	4.451	MICRO-IN.	STRAIN S6A
18	-4.544	-1.167	6.781	1.447	1.859	MICRO-IN.	STRAIN S6B
19	-15.939	7.312	16.103	4.451	8.561	MICRO-IN.	STRAIN S7A
20	-4.218	-1.359	6.835	1.331	1.902	MICRO-IN.	STRAIN S7B
21	-15.097	51.474	170.734	37.023	63.406	Lbs.	WINCH CABLE LOAD
22	-2.810	-0.054	1.592	0.059	0.080	g.	TOP RIGHT ACC. A1
23	-0.867	-0.056	0.902	0.033	0.065	g.	TOP LEFT ACC. A2
26	-0.687	-0.059	0.709	0.030	0.066	g.	BOTTOM RIGHT ACC. A5
27	-2.634	-0.055	1.763	0.061	0.082	g.	BOTTOM LEFT ACC. A6
28	-0.539	-0.043	0.346	0.014	0.045	g.	HORSE ACC. A7X
29	-0.513	-0.042	0.402	0.014	0.044	g.	HORSE ACC. A7Y
30	-1.028	-0.048	1.499	0.044	0.065	g.	HORSE ACC. A7Z
31	0.003	37.761	67.439	22.161	43.784	Degrees	HORSE TILT-METER T1
32	-0.117	37.637	68.231	22.235	43.714	Degrees	GATE TILT-METER T2
33	295.512	295.666	295.801	0.057	295.666	Ft. WATER	U/S POOL
34	295.069	295.155	295.268	0.046	295.155	Ft. WATER	D/S POOL
35	-21.540	34.013	278.913	17.997	38.480	Lbs.	BUMPER PLATE R. SHEA
36	-9.256	35.521	137.590	17.490	39.594	Lbs.	BUMPER PLATE L. SHEA
37	-8.511	19.491	132.959	9.551	21.705	Lbs.	BUMPER PLATE R. MOME
38	-33.895	2.192	87.081	8.328	8.612	Lbs.	BUMPER PLATE L. MOME
40	-0.227	-0.157	0.037	0.053	0.165	Volts	P3X
41	-0.195	0.254	0.925	0.089	0.270	Volts	P3Y
42	-0.376	-0.082	0.205	0.179	0.197	Volts	P4X
43	-0.173	0.297	0.676	0.103	0.314	Volts	P4Y
44	-0.237	-0.118	0.024	0.019	0.119	Volts	P5X
46	-0.349	-0.155	-0.032	0.047	0.162	Volts	P6X
47	-0.188	0.247	0.815	0.128	0.278	Volts	P6Y
48	-25.928	-1.568	11.727	9.928	10.051	Degrees	Winch cable angle

Information File Name: **wicketds19b.inf**  
Sample Rate: 250.000 samples/sec/channel  
Length of Time Recorded: 00:00:40.00  
Data Collected on 8/3/00 2:54:13 PM  
Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test  
\*\*\* TEST #19b Series 1 Condition A 8/3/00  
Balance and calibrated with wicket gate resting at 0 degrees  
Winch cable, hooked to bottom of gate( u/s end )  
Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass  
Gate #6 @ raise gate 0 to 65 degrees  
\*\*\* POOL ELEVATIONS: 295 ft. Head water & 295 ft. Tail water  
\*\*\* TEST CONDITION: wet, gate open 1,2,7,8,12 , no flow test

STATISTICS							
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGR UNITS	TYPE OF GAGE	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-36.978	-25.253	4.721	8.648	26.692 Lbs.	LOAD PIN 3X	
2	-14.408	39.489	122.070	16.978	42.984 Lbs.	LOAD PIN 3Y	
3	-24.186	13.818	60.663	27.537	30.810 Lbs.	LOAD PIN 4X	
4	-14.546	48.538	134.061	20.976	52.876 Lbs.	LOAD PIN 4Y	
5	4.839	21.996	32.112	5.296	22.625 Lbs.	LOAD PIN 5X	
6	-19.558	55.088	156.990	23.959	60.072 Lbs.	LOAD PIN 5Y	
7	-53.748	-26.836	-6.348	9.047	28.320 Lbs.	LOAD PIN 6X	
8	-16.413	41.661	145.253	22.063	47.143 Lbs.	LOAD PIN 6Y	
9	-97.969	16.495	77.069	13.270	21.170 Lbs.	LOAD PIN 1	
10	-403.186	-24.352	32.506	17.876	30.209 LBS.	STRAIN GAGE S1	
11	-124.610	-31.599	5.603	13.215	34.251 LBS.	STRAIN GAGE S2	
12	-4.111	-0.723	3.628	0.465	0.860 MICRO-IN.	STRAIN S3	
13	-0.990	9.278	24.080	5.428	10.749 MICRO-IN.	STRAIN S4A	
14	-5.497	-1.414	17.894	1.464	2.035 MICRO-IN.	STRAIN S4B	
15	-10.960	0.006	8.504	3.897	3.897 MICRO-IN.	STRAIN S5A	
16	-2.990	-0.277	3.712	1.168	1.200 MICRO-IN.	STRAIN S5B	
17	-9.292	1.526	9.715	3.965	4.248 MICRO-IN.	STRAIN S6A	
18	-4.544	-1.179	3.610	1.409	1.837 MICRO-IN.	STRAIN S6B	
19	-2.476	7.340	15.923	4.417	8.566 MICRO-IN.	STRAIN S7A	
20	-4.128	-1.317	2.395	1.280	1.837 MICRO-IN.	STRAIN S7B	
21	-28.292	52.432	191.626	37.699	64.578 Lbs.	WINCH CABLE LOAD	
22	-1.448	-0.056	1.072	0.036	0.066 g.	TOP RIGHT ACC. A1	
23	-0.953	-0.056	0.397	0.021	0.060 g.	TOP LEFT ACC. A2	
26	-0.609	-0.058	0.318	0.020	0.062 g.	BOTTOM RIGHT ACC. A5	
27	-1.349	-0.057	1.266	0.041	0.070 g.	BOTTOM LEFT ACC. A6	
28	-0.517	-0.040	0.454	0.014	0.042 g.	HORSE ACC. A7X	
29	-0.216	-0.040	0.263	0.009	0.041 g.	HORSE ACC. A7Y	
30	-0.725	-0.046	0.179	0.024	0.052 g.	HORSE ACC. A7Z	
31	0.003	36.192	67.341	22.641	42.691 Degrees	HORSE TILT-METER T1	
32	-0.117	36.082	68.182	22.713	42.635 Degrees	GATE TILT-METER T2	
33	295.529	295.635	295.737	0.031	295.635 Ft. WATER	U/S POOL	
34	294.961	295.069	295.142	0.030	295.069 Ft. WATER	D/S POOL	
35	-19.331	35.880	1076.437	21.169	41.659 Lbs.	BUMPER PLATE R. SHEA	
36	-9.256	35.593	113.116	17.863	39.824 Lbs.	BUMPER PLATE L. SHEA	
37	-15.247	20.029	85.803	9.768	22.284 Lbs.	BUMPER PLATE R. MOME	
38	-31.696	3.844	58.487	7.667	8.577 Lbs.	BUMPER PLATE L. MOME	
40	-0.217	-0.157	0.024	0.054	0.166 Volts	P3X	
41	-0.090	0.241	0.840	0.104	0.262 Volts	P3Y	
42	-0.374	-0.085	0.146	0.170	0.190 Volts	P4X	
43	-0.090	0.301	0.845	0.130	0.328 Volt	P4Y	
44	-0.183	-0.122	-0.029	0.029	0.126 Volts	P5X	
46	-0.305	-0.155	-0.037	0.052	0.163 Volts	P6X	
47	-0.098	0.248	0.896	0.131	0.281 Volts	P6Y	
48	-26.989	-2.417	11.939	10.795	11.062 Degree	Winch cable angle	

Information File Name: **wicketds19c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 8/3/00 2:58:50 PM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #19c Series 1 Condition A 8/3/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ raise gate 0 to 65 degrees

\*\*\* POOL ELEVATIONS: 295 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open 1,2,7,8,12 , no flow test

CHAN	STATISTICS					ROOT MEAN ENGR UNITS	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION	SQUARE		
1	-34.224	-24.961	6.294	9.096	26.566	Lbs.	LOAD PIN 3X
2	-33.219	37.901	158.091	18.312	42.094	Lbs.	LOAD PIN 3Y
3	-28.944	14.765	63.439	29.015	32.555	Lbs.	LOAD PIN 4X
4	-27.913	48.095	126.985	20.790	52.396	Lbs.	LOAD PIN 4Y
5	0.880	22.295	45.309	5.613	22.990	Lbs.	LOAD PIN 5X
6	-56.030	54.526	177.605	25.035	59.999	Lbs.	LOAD PIN 5Y
7	-56.710	-26.672	-6.771	8.329	27.942	Lbs.	LOAD PIN 6X
8	-31.184	40.592	147.715	20.552	45.498	Lbs.	LOAD PIN 6Y
9	-765.738	14.938	84.071	17.760	23.207	Lbs.	LOAD PIN 1
10	-176.305	-21.895	54.592	17.670	28.136	LBS.	STRAIN GAGE S1
11	-120.664	-29.271	23.359	11.570	31.475	LBS.	STRAIN GAGE S2
12	-4.930	-1.542	1.989	0.513	1.625	MICRO-IN.	STRAIN S3
13	-8.192	9.120	22.986	5.524	10.663	MICRO-IN.	STRAIN S4A
14	-5.035	-1.433	8.094	1.466	2.049	MICRO-IN.	STRAIN S4B
15	-19.391	0.200	9.760	3.953	3.958	MICRO-IN.	STRAIN S5A
16	-3.080	-0.322	10.415	1.184	1.227	MICRO-IN.	STRAIN S5B
17	-28.842	1.569	9.444	4.025	4.321	MICRO-IN.	STRAIN S6A
18	-4.272	-1.136	7.959	1.433	1.829	MICRO-IN.	STRAIN S6B
19	-19.440	7.341	15.923	4.526	8.624	MICRO-IN.	STRAIN S7A
20	-4.218	-1.320	8.103	1.294	1.849	MICRO-IN.	STRAIN S7B
21	-17.297	52.569	170.734	37.861	64.784	Lbs.	WINCH CABLE LOAD
22	-3.062	-0.058	2.318	0.060	0.083	g.	TOP RIGHT ACC. A1
23	-0.931	-0.055	0.804	0.033	0.064	g.	TOP LEFT ACC. A2
26	-1.054	-0.059	0.789	0.032	0.067	g.	BOTTOM RIGHT ACC. A5
27	-2.841	-0.059	1.667	0.071	0.092	g.	BOTTOM LEFT ACC. A6
28	-0.415	-0.041	0.379	0.014	0.043	g.	HORSE ACC. A7X
29	-0.748	-0.041	0.556	0.016	0.044	g.	HORSE ACC. A7Y
30	-1.353	-0.047	1.168	0.043	0.064	g.	HORSE ACC. A7Z
31	-0.046	35.519	67.635	22.680	42.143	Degrees	HORSE TILT-METER T1
32	-0.166	35.422	68.428	22.753	42.099	Degrees	GATE TILT-METER T2
33	295.625	295.716	295.817	0.036	295.716	Ft. WATER	U/S POOL
34	295.051	295.165	295.250	0.037	295.165	Ft. WATER	D/S POOL
35	-17.121	36.159	316.469	19.711	41.183	Lbs.	BUMPER PLATE R. SHEA
36	-2.581	35.971	148.715	18.103	40.269	Lbs.	BUMPER PLATE L. SHEA
37	-8.511	19.657	144.187	9.948	22.031	Lbs.	BUMPER PLATE R. MOME
38	-31.696	4.080	98.079	8.611	9.528	Lbs.	BUMPER PLATE L. MOME
40	-0.212	-0.155	0.032	0.056	0.165	Volts	P3X
41	-0.222	0.231	1.021	0.112	0.257	Volts	P3Y
42	-0.386	-0.091	0.166	0.179	0.201	Volts	P4X
43	-0.195	0.299	0.801	0.129	0.325	Volts	P4Y
44	-0.237	-0.124	-0.005	0.031	0.128	Volts	P5X
46	-0.330	-0.154	-0.022	0.048	0.161	Volts	P6X
47	-0.200	0.242	0.894	0.122	0.271	Volts	P6Y
48	-26.820	-2.763	11.175	10.960	11.303	Degrees	Winch cable angle

Information File Name: **wicketds4a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/13/00 8:57:42 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #4a Series 1 Condition B

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 down during test.

CHAN NUM	STATISTICS					ROOT MEAN ENGR UNITS SQUARE	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION			
1	-9.048	13.146	46.812	6.808		14.805 Lbs.	LOAD PIN 3X
2	-19.611	17.902	127.674	13.628		22.499 Lbs.	LOAD PIN 3Y
3	-39.253	-3.755	39.253	18.002		18.389 Lbs.	LOAD PIN 4X
4	-11.794	46.531	122.660	23.887		52.304 Lbs.	LOAD PIN 4Y
5	-14.516	1.708	16.716	2.622		3.129 Lbs.	LOAD PIN 5X
6	-35.944	30.068	150.118	16.858		34.472 Lbs.	LOAD PIN 5Y
7	-36.396	-11.949	4.655	5.140		13.008 Lbs.	LOAD PIN 6X
8	-2.872	5.488	14.361	1.978		5.834 Lbs.	LOAD PIN 6Y
9	-339.138	-5.252	79.215	74.201		74.386 Lbs.	LOAD PIN 1
10	-115.072	-5.421	36.851	10.676		11.973 LBS.	STRAIN GAGE S1
11	-91.818	-25.498	22.880	15.603		29.893 LBS.	STRAIN GAGE S2
12	-3.342	-1.000	1.966	0.873		1.327 MICRO-IN.	STRAIN S3
13	-1.259	25.803	37.858	12.467		28.657 MICRO-IN.	STRAIN S4A
14	-10.706	-7.374	1.774	3.803		8.296 MICRO-IN.	STRAIN S4B
15	0.595	18.319	43.999	10.880		21.306 MICRO-IN.	STRAIN S5A
16	-9.168	-4.071	2.128	3.070		5.099 MICRO-IN.	STRAIN S5B
17	-7.108	16.853	29.683	10.879		20.059 MICRO-IN.	STRAIN S6A
18	-7.654	-4.584	3.631	3.435		5.728 MICRO-IN.	STRAIN S6B
19	-4.033	18.979	31.826	10.918		21.895 MICRO-IN.	STRAIN S7A
20	-8.090	-4.425	1.769	2.852		5.265 MICRO-IN.	STRAIN S7B
21	-6.007	166.383	263.903	80.063		184.644 Lbs.	WINCH CABLE LOAD
22	-1.109	0.004	1.767	0.060		0.060 g.	TOP RIGHT ACC. A1
23	-0.870	0.007	1.396	0.033		0.034 g.	TOP LEFT ACC. A2
24	-0.009	0.019	0.040	0.002		0.019 g.	MID. RIGHT ACC. A3
25	-0.035	0.000	0.028	0.002		0.002 g.	MID. LEFT ACC. A4
26	0.013	0.030	0.050	0.002		0.030 g.	BOTTOM RIGHT ACC. A5
27	-0.021	0.010	0.033	0.002		0.011 g.	BOTTOM LEFT ACC. A6
28	-0.461	0.016	0.531	0.014		0.022 g.	HORSE ACC. A7X
29	-0.753	0.005	0.275	0.014		0.015 g.	HORSE ACC. A7Y
30	-0.849	0.009	1.322	0.031		0.032 g.	HORSE ACC. A7Z
31	0.132	37.784	67.200	21.686		43.565 Degrees	HORSE TILT-METER T1
32	0.032	37.618	65.889	21.713		43.435 Degrees	GATE TILT-METER T2
33	297.768	297.984	298.375	0.148		297.984 Ft. WATER	U/S POOL
34	294.488	294.895	295.339	0.184		294.895 Ft. WATER	D/S POOL
40	-0.056	0.082	0.300	0.042		0.092 Volts	P3X
41	-0.120	0.109	0.862	0.083		0.137 Volts	P3Y
42	-0.244	0.023	0.244	0.111		0.113 Volts	P4X
43	-0.076	0.289	0.781	0.148		0.325 Volts	P4Y
44	-0.103	-0.010	0.083	0.015		0.017 Volts	P5X
45	-0.154	0.139	0.762	0.078		0.160 Volts	P5Y
46	-0.251	-0.069	0.027	0.030		0.075 Volts	P6X
47	-0.010	0.032	0.095	0.012		0.035 Volts	P6Y
48	-36.818	-23.371	-15.388	5.484		24.006 Degrees	Winch cable angle

Information File Name: **wicketds4b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/13/00 8:59:48 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #4b Series 1 Condition B

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 down during test.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGR	UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-8.654	13.777	42.878	6.749	15.341	Lbs.	LOAD PIN 3X
2	-36.021	16.228	178.503	10.992	19.600	Lbs.	LOAD PIN 3Y
3	-39.253	-4.176	42.028	18.306	18.776	Lbs.	LOAD PIN 4X
4	-8.256	46.265	102.217	21.894	51.184	Lbs.	LOAD PIN 4Y
5	-13.197	1.844	23.754	2.640	3.221	Lbs.	LOAD PIN 5X
6	-49.158	27.662	187.119	17.534	32.750	Lbs.	LOAD PIN 5Y
7	-30.895	-10.808	2.962	3.486	11.357	Lbs.	LOAD PIN 6X
8	-1.641	5.194	11.899	2.013	5.570	Lbs.	LOAD PIN 6Y
9	-543.491	-9.961	118.683	80.981	81.591	Lbs.	LOAD PIN 1
10	-134.549	-5.111	48.537	10.456	11.639	LBS.	STRAIN GAGE S1
11	-70.065	-23.690	28.813	15.614	28.373	LBS.	STRAIN GAGE S2
12	-3.617	-0.942	2.606	0.920	1.316	MICRO-IN.	STRAIN S3
13	-3.362	25.095	39.686	13.384	28.441	MICRO-IN.	STRAIN S4A
14	-11.353	-7.272	6.304	4.117	8.357	MICRO-IN.	STRAIN S4B
15	1.140	18.370	40.095	11.775	21.820	MICRO-IN.	STRAIN S5A
16	-8.895	-3.995	3.221	3.313	5.190	MICRO-IN.	STRAIN S5B
17	-8.573	16.636	31.513	11.827	20.412	MICRO-IN.	STRAIN S6A
18	-8.018	-4.406	4.360	3.727	5.771	MICRO-IN.	STRAIN S6B
19	-6.040	18.468	33.104	11.641	21.831	MICRO-IN.	STRAIN S7A
20	-9.733	-4.334	2.134	3.040	5.294	MICRO-IN.	STRAIN S7B
21	-8.219	163.406	272.752	83.593	183.546	Lbs.	WINCH CABLE LOAD
22	-2.021	0.004	1.360	0.058	0.059	g.	TOP RIGHT ACC. A1
23	-0.417	0.007	1.029	0.030	0.031	g.	TOP LEFT ACC. A2
24	-0.019	0.019	0.059	0.002	0.019	g.	MID. RIGHT ACC. A3
25	-0.023	0.000	0.026	0.002	0.002	g.	MID. LEFT ACC. A4
26	0.013	0.030	0.058	0.002	0.030	g.	BOTTOM RIGHT ACC. A5
27	-0.019	0.010	0.071	0.002	0.011	g.	BOTTOM LEFT ACC. A6
28	-0.880	0.016	0.665	0.020	0.026	g.	HORSE ACC. A7X
29	-0.754	0.004	0.289	0.014	0.015	g.	HORSE ACC. A7Y
30	-0.505	0.008	0.995	0.035	0.036	g.	HORSE ACC. A7Z
31	0.107	38.308	67.027	21.624	43.990	Degrees	HORSE TILT-METER T1
32	0.032	38.148	65.889	21.651	43.863	Degrees	GATE TILT-METER T2
33	297.707	298.019	298.329	0.167	298.019	Ft. WATER	U/S POOL
34	294.579	294.874	295.284	0.194	294.874	Ft. WATER	D/S POOL
40	-0.051	0.086	0.271	0.042	0.096	Volts	P3X
41	-0.225	0.099	1.101	0.067	0.119	Volts	P3Y
42	-0.261	0.026	0.247	0.113	0.116	Volts	P4X
43	-0.061	0.287	0.686	0.136	0.318	Volts	P4Y
44	-0.125	-0.010	0.085	0.015	0.018	Volts	P5X
45	-0.239	0.128	0.889	0.081	0.152	Volts	P5Y
46	-0.198	-0.062	0.017	0.020	0.066	Volts	P6X
47	-0.010	0.031	0.073	0.012	0.033	Volts	P6Y
48	-37.805	-23.490	-15.339	5.403	24.104	Degrees	Winch cable angle

Information File Name: **wicketds4c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/13/00 9:02:17 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #4c Series 1 Condition B

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 down during test.

CHAN NUM	STATISTICS					ROOT MEAN ENGR UNITS SQUARE	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION			
1	-7.868	13.161	42.878	5.920		14.431 Lbs.	LOAD PIN 3X
2	-30.818	17.010	137.279	11.183		20.356 Lbs.	LOAD PIN 3Y
3	-42.028	-5.568	42.425	20.199		20.952 Lbs.	LOAD PIN 4X
4	-9.435	48.366	137.599	22.725		53.439 Lbs.	LOAD PIN 4Y
5	-11.877	1.984	18.915	2.927		3.536 Lbs.	LOAD PIN 5X
6	-42.287	27.654	188.705	15.970		31.934 Lbs.	LOAD PIN 5Y
7	-33.857	-10.844	4.655	3.989		11.554 Lbs.	LOAD PIN 6X
8	-0.821	5.597	16.823	1.889		5.907 Lbs.	LOAD PIN 6Y
9	-430.351	-14.072	86.232	87.607		88.730 Lbs.	LOAD PIN 1
10	-101.437	-4.072	44.642	10.131		10.918 LBS.	STRAIN GAGE S1
11	-97.750	-25.075	18.925	15.925		29.705 LBS.	STRAIN GAGE S2
12	-3.434	-0.949	1.508	0.835		1.263 MICRO-IN.	STRAIN S3
13	-2.905	23.917	36.304	12.690		27.075 MICRO-IN.	STRAIN S4A
14	-10.798	-6.988	6.304	4.042		8.073 MICRO-IN.	STRAIN S4B
15	1.230	18.374	44.181	9.861		20.853 MICRO-IN.	STRAIN S5A
16	-8.895	-3.872	2.492	2.971		4.880 MICRO-IN.	STRAIN S5B
17	-7.658	16.233	29.957	11.119		19.676 MICRO-IN.	STRAIN S6A
18	-7.290	-4.203	4.542	3.669		5.579 MICRO-IN.	STRAIN S6B
19	-4.854	17.500	29.636	10.596		20.458 MICRO-IN.	STRAIN S7A
20	-7.634	-4.166	1.769	2.783		5.010 MICRO-IN.	STRAIN S7B
21	-4.900	160.489	259.478	79.501		179.101 Lbs.	WINCH CABLE LOAD
22	-2.612	0.004	2.146	0.068		0.068 g.	TOP RIGHT ACC. A1
23	-1.425	0.007	0.721	0.036		0.037 g.	TOP LEFT ACC. A2
24	-0.014	0.019	0.035	0.002		0.019 g.	MID. RIGHT ACC. A3
25	-0.019	0.000	0.033	0.002		0.002 g.	MID. LEFT ACC. A4
26	-0.005	0.030	0.045	0.002		0.030 g.	BOTTOM RIGHT ACC. A5
27	-0.033	0.010	0.042	0.002		0.011 g.	BOTTOM LEFT ACC. A6
28	-0.382	0.017	0.282	0.013		0.021 g.	HORSE ACC. A7X
29	-0.378	0.005	0.451	0.013		0.014 g.	HORSE ACC. A7Y
30	-2.301	0.009	1.327	0.050		0.050 g.	HORSE ACC. A7Z
31	0.107	38.763	67.126	21.596		44.373 Degrees	HORSE TILT-METER T1
32	-0.017	38.596	65.889	21.630		44.243 Degrees	GATE TILT-METER T2
33	297.586	298.103	298.481	0.241		298.103 Ft. WATER	U/S POOL
34	294.597	294.957	295.266	0.154		294.957 Ft. WATER	D/S POOL
40	-0.051	0.082	0.259	0.037		0.090 Volts	P3X
41	-0.193	0.104	0.779	0.068		0.124 Volts	P3Y
42	-0.273	0.034	0.271	0.124		0.129 Volts	P4X
43	-0.059	0.300	0.830	0.141		0.332 Volts	P4Y
44	-0.117	-0.011	0.066	0.016		0.020 Volts	P5X
45	-0.188	0.128	0.811	0.073		0.148 Volts	P5Y
46	-0.181	-0.063	0.027	0.023		0.067 Volts	P6X
47	-0.005	0.033	0.095	0.011		0.035 Volts	P6Y
48	-36.547	-23.234	-15.758	5.290		23.829 Degrees	Winch cable angle

Information File Name: **wicketds5a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/21/00 10:19:31 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #5a Series 1 Condition B 7/21/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 down during test.

CHAN		STATISTICS					ROOT MEAN ENGR UNITS	TYPE OF GAGE
NUM	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION	SQUARE			
1	-22.029	0.857	25.176	6.760	6.814	Lbs.	LOAD PIN 3X	
2	-68.039	3.050	136.479	12.841	13.198	Lbs.	LOAD PIN 3Y	
3	-45.597	0.670	55.113	24.910	24.919	Lbs.	LOAD PIN 4X	
4	-18.871	50.315	133.668	26.889	57.049	Lbs.	LOAD PIN 4Y	
5	-7.038	8.839	29.913	3.432	9.482	Lbs.	LOAD PIN 5X	
6	-95.145	14.860	146.947	20.996	25.723	Lbs.	LOAD PIN 5Y	
7	-46.977	-22.013	-7.195	3.874	22.351	Lbs.	LOAD PIN 6X	
8	-7.796	65.044	175.207	22.754	68.909	Lbs.	LOAD PIN 6Y	
9	-610.870	-7.751	79.522	82.341	82.705	Lbs.	LOAD PIN 1	
10	-202.408	-24.857	41.620	12.464	27.807	LBS.	STRAIN GAGE S1	
11	-136.119	-45.382	4.128	16.534	48.300	LBS.	STRAIN GAGE S2	
12	-2.296	-0.484	3.888	0.979	1.092	MICRO-IN.	STRAIN S3	
13	-7.148	28.796	43.233	14.073	32.051	MICRO-IN.	STRAIN S4A	
14	-11.320	-7.045	12.045	4.249	8.227	MICRO-IN.	STRAIN S4B	
15	1.142	23.055	49.032	12.126	26.049	MICRO-IN.	STRAIN S5A	
16	-11.619	-5.224	4.815	3.418	6.243	MICRO-IN.	STRAIN S5B	
17	-10.407	19.576	31.747	11.929	22.924	MICRO-IN.	STRAIN S6A	
18	-9.222	-5.785	4.837	3.801	6.922	MICRO-IN.	STRAIN S6B	
19	-6.339	21.379	32.924	11.512	24.281	MICRO-IN.	STRAIN S7A	
20	-8.463	-5.280	2.662	3.101	6.123	MICRO-IN.	STRAIN S7B	
21	-5.058	194.735	285.248	86.559	213.106	Lbs.	WINCH CABLE LOAD	
22	-1.945	-0.057	1.660	0.074	0.094	g.	TOP RIGHT ACC. A1	
23	-1.161	-0.058	1.046	0.042	0.071	g.	TOP LEFT ACC. A2	
24	-1.414	-0.056	0.901	0.033	0.065	g.	MID. RIGHT ACC. A3	
25	-1.777	-0.052	1.179	0.038	0.064	g.	MID. LEFT ACC. A4	
26	-1.080	-0.061	1.058	0.038	0.072	g.	BOTTOM RIGHT ACC. A5	
27	-1.776	-0.059	1.648	0.071	0.092	g.	BOTTOM LEFT ACC. A6	
28	-0.442	-0.038	0.459	0.016	0.041	g.	HORSE ACC. A7X	
29	-0.776	-0.039	0.405	0.018	0.043	g.	HORSE ACC. A7Y	
30	-1.365	-0.043	1.726	0.051	0.067	g.	HORSE ACC. A7Z	
31	-0.046	37.598	67.733	21.604	43.363	Degrees	HORSE TILT-METER T1	
32	-0.215	37.454	69.363	21.652	43.262	Degrees	GATE TILT-METER T2	
33	297.298	297.827	298.390	0.269	297.827	Ft. WATER	U/S POOL	
34	294.000	294.444	295.031	0.318	294.444	Ft. WATER	D/S POOL	
40	-0.142	0.006	0.154	0.042	0.043	Volts	P3X	
41	-0.410	0.018	0.959	0.078	0.080	Volts	P3Y	
42	-0.339	-0.004	0.278	0.153	0.153	Volts	P4X	
43	-0.115	0.312	0.767	0.167	0.354	Volts	P4Y	
44	-0.161	-0.049	0.049	0.019	0.053	Volts	P5X	
45	-0.420	0.071	0.740	0.096	0.119	Volts	P5Y	
46	-0.283	-0.127	-0.037	0.022	0.129	Volts	P6X	
47	-0.044	0.387	0.991	0.135	0.410	Volts	P6Y	
48	-37.558	-24.163	-15.487	5.411	24.761	Degrees	Winch cable angle	



Information File Name: **wicketds5d.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/21/00 10:24:16 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #5d Series 1 Condition C 7/21/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 down during test.

CHAN NUM	STATISTICS					ROOT MEAN ENGR UNITS	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION	SQUARE		
1	-18.882	4.733	29.110	6.341	7.912 Lbs.		LOAD PIN 3X
2	-64.837	-9.720	125.272	15.487	18.284 Lbs.		LOAD PIN 3Y
3	-53.923	1.672	55.113	23.537	23.596 Lbs.		LOAD PIN 4X
4	-19.264	47.578	99.465	30.908	56.736 Lbs.		LOAD PIN 4Y
5	-6.598	7.497	22.435	2.589	7.932 Lbs.		LOAD PIN 5X
6	-76.645	4.512	153.290	22.881	23.322 Lbs.		LOAD PIN 5Y
7	-46.553	-20.761	-8.041	5.777	21.550 Lbs.		LOAD PIN 6X
8	4.924	63.417	163.718	22.066	67.147 Lbs.		LOAD PIN 6Y
9	-528.618	-9.936	94.397	82.251	82.849 Lbs.		LOAD PIN 1
10	-119.128	-17.974	37.747	15.125	23.491 LBS.		STRAIN GAGE S1
11	-112.415	-44.608	2.153	19.453	48.665 LBS.		STRAIN GAGE S2
12	-3.115	-0.491	3.433	1.184	1.282 MICRO-IN.		STRAIN S3
13	0.062	27.647	40.038	12.791	30.462 MICRO-IN.		STRAIN S4A
14	-10.584	-6.917	4.226	3.866	7.924 MICRO-IN.		STRAIN S4B
15	0.691	23.149	58.501	12.171	26.153 MICRO-IN.		STRAIN S5A
16	-13.707	-5.088	1.365	3.183	6.002 MICRO-IN.		STRAIN S5B
17	-4.865	19.007	33.746	10.900	21.911 MICRO-IN.		STRAIN S6A
18	-8.496	-5.399	3.114	3.525	6.448 MICRO-IN.		STRAIN S6B
19	-1.171	20.712	33.378	10.713	23.319 MICRO-IN.		STRAIN S7A
20	-8.827	-5.103	0.929	2.922	5.880 MICRO-IN.		STRAIN S7B
21	-8.357	186.119	273.152	82.503	203.586 Lbs.		WINCH CABLE LOAD
22	-1.966	-0.057	1.110	0.064	0.085 g.		TOP RIGHT ACC. A1
23	-1.032	-0.058	1.558	0.039	0.070 g.		TOP LEFT ACC. A2
24	-1.613	-0.055	1.011	0.032	0.064 g.		MID. RIGHT ACC. A3
25	-1.978	-0.052	1.079	0.040	0.065 g.		MID. LEFT ACC. A4
26	-1.119	-0.061	1.146	0.033	0.069 g.		BOTTOM RIGHT ACC. A5
27	-2.132	-0.059	1.614	0.065	0.088 g.		BOTTOM LEFT ACC. A6
28	-0.456	-0.038	0.214	0.014	0.041 g.		HORSE ACC. A7X
29	-0.463	-0.040	0.368	0.016	0.042 g.		HORSE ACC. A7Y
30	-0.972	-0.044	1.641	0.047	0.064 g.		HORSE ACC. A7Z
31	-0.046	36.525	67.292	22.396	42.845 Degrees		HORSE TILT-METER T1
32	-0.166	36.400	69.166	22.448	42.765 Degrees		GATE TILT-METER T2
33	297.541	297.953	298.360	0.244	297.953 Ft. WATER		U/S POOL
34	293.982	294.360	294.705	0.199	294.360 Ft. WATER		D/S POOL
40	-0.115	0.030	0.173	0.039	0.050 Volts		P3X
41	-0.400	-0.059	0.659	0.094	0.111 Volts		P3Y
42	-0.342	-0.010	0.300	0.145	0.145 Volts		P4X
43	-0.117	0.295	0.642	0.192	0.352 Volts		P4Y
44	-0.132	-0.042	0.039	0.014	0.044 Volts		P5X
45	-0.374	0.023	0.613	0.104	0.107 Volts		P5Y
46	-0.283	-0.120	-0.046	0.033	0.124 Volts		P6X
47	0.029	0.377	0.930	0.131	0.399 Volts		P6Y
48	-38.693	-24.330	-15.240	6.137	25.092 Degrees		Winch cable angle

Information File Name: **wicketds2a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/10/00 9:38:23 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #2a Series 1 Condition B

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, single gate operation.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGR	UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-8.654	10.513	30.684	8.091	13.266	Lbs.	LOAD PIN 3X
2	-7.204	26.491	99.257	11.286	28.795	Lbs.	LOAD PIN 3Y
3	-35.684	-4.706	35.684	16.732	17.381	Lbs.	LOAD PIN 4X
4	-14.153	38.805	147.035	21.389	44.309	Lbs.	LOAD PIN 4Y
5	-12.317	1.728	19.355	3.039	3.496	Lbs.	LOAD PIN 5X
6	-12.686	33.635	135.318	12.476	35.874	Lbs.	LOAD PIN 5Y
7	-27.932	-7.445	8.464	4.579	8.741	Lbs.	LOAD PIN 6X
8	-9.848	63.590	150.998	24.752	68.238	Lbs.	LOAD PIN 6Y
9	-406.810	-12.018	93.160	107.817	108.484	Lbs.	LOAD PIN 1
10	-94.480	-18.357	20.668	11.020	21.411	LBS.	STRAIN GAGE S1
11	-112.866	-31.720	19.755	18.084	36.513	LBS.	STRAIN GAGE S2
12	-24.208	-6.517	11.362	9.799	11.768	MICRO-IN.	STRAIN S3
13	3.071	29.396	40.154	12.068	31.777	MICRO-IN.	STRAIN S4A
14	-11.107	-7.415	2.620	3.942	8.398	MICRO-IN.	STRAIN S4B
15	0.619	22.717	45.331	11.540	25.480	MICRO-IN.	STRAIN S5A
16	-12.114	-5.544	2.637	3.470	6.540	MICRO-IN.	STRAIN S5B
17	-7.524	20.772	35.319	12.327	24.154	MICRO-IN.	STRAIN S6A
18	-9.158	-6.040	3.356	3.846	7.160	MICRO-IN.	STRAIN S6B
19	-4.715	21.638	33.295	11.771	24.633	MICRO-IN.	STRAIN S7A
20	-8.217	-5.129	2.349	3.175	6.032	MICRO-IN.	STRAIN S7B
21	-1.625	193.576	273.687	88.332	212.778	Lbs.	WINCH CABLE LOAD
22	-1.929	0.005	1.293	0.060	0.060	g.	TOP RIGHT ACC. A1
23	-0.619	0.011	0.834	0.029	0.031	g.	TOP LEFT ACC. A2
24	-1.049	-0.007	0.610	0.024	0.025	g.	MID. RIGHT ACC. A3
25	-0.879	0.003	0.865	0.027	0.028	g.	MID. LEFT ACC. A4
26	-0.512	0.022	0.699	0.024	0.033	g.	BOTTOM RIGHT ACC. A5
27	-1.141	0.013	1.211	0.055	0.056	g.	BOTTOM LEFT ACC. A6
28	-0.243	0.019	0.266	0.012	0.023	g.	HORSE ACC. A7X
29	-0.321	0.006	0.626	0.013	0.014	g.	HORSE ACC. A7Y
30	-0.710	0.010	1.016	0.032	0.033	g.	HORSE ACC. A7Z
31	0.057	37.132	68.040	21.935	43.127	Degrees	HORSE TILT-METER T1
32	0.082	36.983	65.889	21.925	42.994	Degrees	GATE TILT-METER T2
33	297.632	297.927	298.381	0.196	297.927	Ft. WATER	U/S POOL
34	294.434	294.696	294.977	0.117	294.696	Ft. WATER	D/S POOL
40	-0.027	0.032	0.100	0.025	0.041	Volts	P3X
41	-0.022	0.081	0.313	0.034	0.088	Volts	P3Y
42	-0.110	0.014	0.110	0.052	0.053	Volts	P4X
43	-0.059	0.120	0.474	0.066	0.138	Volts	P4Y
44	-0.059	-0.005	0.034	0.008	0.010	Volts	P5X
45	-0.024	0.079	0.327	0.028	0.084	Volts	P5Y
46	-0.083	-0.022	0.022	0.013	0.025	Volts	P6X
47	-0.029	0.189	0.459	0.074	0.203	Volts	P6Y
48	-37.114	-23.681	-14.599	5.804	24.382	Degrees	Winch cable angle

Information File Name: **wicketds2b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/10/00 9:49:06 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #2b Series 1 Condition B

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, single gate operation.

STATISTICS							TYPE OF GAGE
CHAN NUM	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION	ROOT MEAN ENGR SQUARE UNITS		
1	-7.868	11.416	35.404	8.105	14.001 Lbs.	LOAD PIN 3X	
2	-9.606	27.392	98.457	10.516	29.341 Lbs.	LOAD PIN 3Y	
3	-37.270	-4.832	35.684	17.663	18.312 Lbs.	LOAD PIN 4X	
4	-14.153	38.333	99.072	19.453	42.986 Lbs.	LOAD PIN 4Y	
5	-14.077	1.799	20.235	2.895	3.408 Lbs.	LOAD PIN 5X	
6	-20.086	31.785	93.031	12.189	34.042 Lbs.	LOAD PIN 5Y	
7	-23.700	-6.203	7.618	3.997	7.379 Lbs.	LOAD PIN 6X	
8	-3.283	63.021	106.683	23.269	67.179 Lbs.	LOAD PIN 6Y	
9	-472.133	-22.623	112.003	121.259	123.351 Lbs.	LOAD PIN 1	
10	-80.818	-16.928	26.523	10.907	20.137 LBS.	STRAIN GAGE S1	
11	-71.298	-31.092	15.796	17.053	35.462 LBS.	STRAIN GAGE S2	
12	-22.840	-6.702	11.271	9.898	11.954 MICRO-IN.	STRAIN S3	
13	2.069	27.545	39.061	12.176	30.116 MICRO-IN.	STRAIN S4A	
14	-10.923	-7.116	3.173	4.171	8.248 MICRO-IN.	STRAIN S4B	
15	0.348	21.623	41.168	11.076	24.295 MICRO-IN.	STRAIN S5A	
16	-9.838	-5.047	2.728	3.529	6.158 MICRO-IN.	STRAIN S5B	
17	-7.979	19.402	33.227	12.769	23.227 MICRO-IN.	STRAIN S6A	
18	-8.523	-5.440	3.809	4.077	6.798 MICRO-IN.	STRAIN S6B	
19	-4.988	20.004	31.659	11.906	23.278 MICRO-IN.	STRAIN S7A	
20	-7.670	-4.811	2.349	3.219	5.788 MICRO-IN.	STRAIN S7B	
21	-0.520	184.265	257.102	87.594	204.025 Lbs.	WINCH CABLE LOAD	
22	-1.097	0.005	1.451	0.057	0.057 g.	TOP RIGHT ACC. A1	
23	-0.505	0.010	0.436	0.027	0.029 g.	TOP LEFT ACC. A2	
24	-0.727	-0.008	0.404	0.023	0.024 g.	MID. RIGHT ACC. A3	
25	-0.680	0.003	0.604	0.022	0.022 g.	MID. LEFT ACC. A4	
26	-0.304	0.022	0.602	0.022	0.031 g.	BOTTOM RIGHT ACC. A5	
27	-1.142	0.013	1.635	0.059	0.061 g.	BOTTOM LEFT ACC. A6	
28	-0.414	0.021	0.548	0.013	0.024 g.	HORSE ACC. A7X	
29	-0.344	0.007	0.300	0.012	0.013 g.	HORSE ACC. A7Y	
30	-0.514	0.011	0.739	0.025	0.027 g.	HORSE ACC. A7Z	
31	0.033	38.649	67.496	21.649	44.299 Degrees	HORSE TILT-METER T1	
32	0.008	38.503	65.889	21.661	44.178 Degrees	GATE TILT-METER T2	
33	297.662	297.951	298.396	0.213	297.952 Ft. WATER	U/S POOL	
34	294.434	294.871	295.212	0.172	294.871 Ft. WATER	D/S POOL	
40	-0.024	0.035	0.110	0.025	0.043 Volts	P3X	
41	-0.027	0.083	0.293	0.032	0.089 Volts	P3Y	
42	-0.112	0.015	0.115	0.054	0.056 Volts	P4X	
43	-0.044	0.119	0.310	0.060	0.133 Volts	P4Y	
44	-0.054	-0.005	0.037	0.008	0.009 Volts	P5X	
45	-0.042	0.074	0.210	0.028	0.079 Volts	P5Y	
46	-0.063	-0.018	0.022	0.012	0.021 Volts	P6X	
47	-0.010	0.187	0.320	0.069	0.200 Volts	P6Y	
48	-36.794	-23.359	-15.832	5.442	23.985 Degrees	Winch cable angle	

Information File Name: **wicketds2c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/10/00 9:54:41 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #2c Series 1 Condition B

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, single gate operation.

STATISTICS						ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD			
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-14.162	11.634	30.684	7.265	13.716 Lbs.		LOAD PIN 3X
2	-24.014	24.994	121.670	11.348	27.450 Lbs.		LOAD PIN 3Y
3	-40.442	-4.442	38.063	18.017	18.556 Lbs.		LOAD PIN 4X
4	-7.863	41.859	136.813	19.551	46.199 Lbs.		LOAD PIN 4Y
5	-12.317	2.406	19.355	2.961	3.815 Lbs.		LOAD PIN 5X
6	-25.372	29.543	151.176	12.711	32.162 Lbs.		LOAD PIN 5Y
7	-31.318	-6.817	8.464	4.057	7.933 Lbs.		LOAD PIN 6X
8	-5.744	64.824	153.460	24.444	69.280 Lbs.		LOAD PIN 6Y
9	-573.885	-22.580	123.309	123.714	125.758 Lbs.		LOAD PIN 1
10	-127.658	-12.837	28.475	10.782	16.764 LBS.		STRAIN GAGE S1
11	-108.907	-32.769	15.796	17.454	37.127 LBS.		STRAIN GAGE S2
12	-23.296	-6.925	11.180	9.977	12.145 MICRO-IN.		STRAIN S3
13	2.160	27.426	44.710	12.039	29.952 MICRO-IN.		STRAIN S4A
14	-12.213	-7.242	17.453	4.123	8.333 MICRO-IN.		STRAIN S4B
15	-0.105	21.994	54.925	10.983	24.584 MICRO-IN.		STRAIN S5A
16	-12.478	-5.125	3.183	3.482	6.196 MICRO-IN.		STRAIN S5B
17	-8.343	19.463	38.957	12.680	23.229 MICRO-IN.		STRAIN S6A
18	-8.614	-5.444	3.900	4.036	6.777 MICRO-IN.		STRAIN S6B
19	-5.351	19.931	34.387	11.788	23.156 MICRO-IN.		STRAIN S7A
20	-9.674	-4.838	2.349	3.204	5.802 MICRO-IN.		STRAIN S7B
21	-0.520	183.715	258.208	86.929	203.243 Lbs.		WINCH CABLE LOAD
22	-1.328	0.005	1.106	0.063	0.063 g.		TOP RIGHT ACC. A1
23	-0.780	0.011	0.898	0.034	0.036 g.		TOP LEFT ACC. A2
24	-1.362	-0.007	1.305	0.040	0.040 g.		MID. RIGHT ACC. A3
25	-1.651	0.003	2.027	0.050	0.050 g.		MID. LEFT ACC. A4
26	-0.596	0.021	0.858	0.027	0.034 g.		BOTTOM RIGHT ACC. A5
27	-1.734	0.013	0.947	0.073	0.074 g.		BOTTOM LEFT ACC. A6
28	-0.231	0.019	0.313	0.012	0.023 g.		HORSE ACC. A7X
29	-0.606	0.006	0.387	0.014	0.015 g.		HORSE ACC. A7Y
30	-1.159	0.010	1.991	0.047	0.048 g.		HORSE ACC. A7Z
31	0.008	38.061	67.348	21.827	43.875 Degrees		HORSE TILT-METER T1
32	0.008	37.925	65.889	21.830	43.759 Degrees		GATE TILT-METER T2
33	297.724	297.943	298.381	0.204	297.944 Ft. WATER		U/S POOL
34	294.217	294.790	295.176	0.249	294.790 Ft. WATER		D/S POOL
40	-0.051	0.036	0.107	0.023	0.042 Volts		P3X
41	-0.066	0.076	0.391	0.035	0.084 Volts		P3Y
42	-0.117	0.013	0.125	0.055	0.057 Volts		P4X
43	-0.032	0.130	0.437	0.061	0.143 Volts		P4Y
44	-0.056	-0.007	0.034	0.008	0.011 Volts		P5X
45	-0.061	0.069	0.383	0.029	0.075 Volts		P5Y
46	-0.098	-0.020	0.037	0.012	0.023 Volts		P6X
47	-0.017	0.193	0.493	0.073	0.206 Volts		P6Y
48	-36.596	-23.508	-15.438	5.540	24.152 Degrees		Winch cable angle

Information File Name: **wicketds31a.inf**

Sample Rate: 1000.000 samples/sec/channel

Length of Time Recorded: 00:00:45.00

Data Collected on 11/1/00 8:32:23 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST 31a 11/01/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1-30 & 33-47 filtered at 200 Hz. Low Pass

Gate #6 @ raised, locked position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 down  
during test. Check test for load pins (test 6a, 6b, 6c)

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN	ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-22.029	-10.641	30.684	10.184	14.729	Lbs.	LOAD PIN 3X
2	-112.865	-57.574	79.646	24.390	62.528	Lbs.	LOAD PIN 3Y
3	-22.600	23.993	83.660	31.502	39.598	Lbs.	LOAD PIN 4X
4	-40.887	74.103	173.375	49.359	89.037	Lbs.	LOAD PIN 4Y
5	-19.795	-0.967	9.238	3.673	3.798	Lbs.	LOAD PIN 5X
6	-42.815	36.017	178.133	29.751	46.716	Lbs.	LOAD PIN 5Y
7	-48.246	-32.215	-6.348	8.158	33.232	Lbs.	LOAD PIN 6X
8	-17.233	61.300	100.939	24.369	65.966	Lbs.	LOAD PIN 6Y
9	-446.005	-11.815	81.739	118.352	118.940	Lbs.	LOAD PIN 1
10	-140.674	-2.592	56.195	20.529	20.692	LBS.	STRAIN GAGE S1
11	-108.965	-42.861	31.862	24.528	49.384	LBS.	STRAIN GAGE S2
12	-4.009	-0.298	5.594	1.806	1.830	MICRO-IN.	STRAIN S3
13	-2.075	47.975	68.014	18.391	51.379	MICRO-IN.	STRAIN S4A
14	-17.436	-12.516	6.350	5.103	13.516	MICRO-IN.	STRAIN S4B
15	1.266	34.975	61.086	16.092	38.499	MICRO-IN.	STRAIN S5A
16	-14.305	-7.965	4.794	4.577	9.187	MICRO-IN.	STRAIN S5B
17	-12.637	29.204	44.184	15.083	32.869	MICRO-IN.	STRAIN S6A
18	-12.872	-8.334	5.924	4.600	9.519	MICRO-IN.	STRAIN S6B
19	-7.213	37.899	53.874	17.092	41.575	MICRO-IN.	STRAIN S7A
20	-13.702	-8.627	3.775	4.341	9.657	MICRO-IN.	STRAIN S7B
21	-16.923	291.231	396.534	109.841	311.256	Lbs.	WINCH CABLE LOAD
31	-0.340	36.362	68.125	21.363	42.174	Degrees	HORSE TILT-METER T1
32	-0.264	36.444	70.151	21.451	42.288	Degrees	GATE TILT-METER T2
33	300.271	300.642	301.281	0.240	300.642	Ft. WATER	U/S POOL
34	294.219	294.713	295.142	0.202	294.713	Ft. WATER	D/S POOL
48	-25.419	-0.029	15.038	10.052	10.052	Degrees	Winch cable angle

Information File Name: **wicketds31b.inf**

Sample Rate: 1000.000 samples/sec/channel

Length of Time Recorded: 00:00:45.00

Data Collected on 11/1/00 8:32:23 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST 31b 11/01/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s' end )

Channel 1-30 & 33-47 filtered at 200 Hz. Low Pass

Gate #6 @ raised, locked position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 down  
during test. Check test for load pins (test 6a, 6b, 6c) Corection of winch cable angle.

CHAN	STATISTICS					ENGINEERING UNITS	TYPE OF GAGE
	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN SQUARE		
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION			
1	-22.029	-10.641	30.684	10.184	14.729	Lbs.	LOAD PIN 3X
2	-112.865	-57.574	79.646	24.390	62.528	Lbs.	LOAD PIN 3Y
3	-22.600	23.993	83.660	31.502	39.598	Lbs.	LOAD PIN 4X
4	-40.887	74.103	173.375	49.359	89.037	Lbs.	LOAD PIN 4Y
5	-19.795	-0.967	9.238	3.673	3.798	Lbs.	LOAD PIN 5X
6	-42.815	36.017	178.133	29.751	46.716	Lbs.	LOAD PIN 5Y
7	-48.246	-32.215	-6.348	8.158	33.232	Lbs.	LOAD PIN 6X
8	-17.233	61.300	100.939	24.369	65.966	Lbs.	LOAD PIN 6Y
9	-446.005	-11.815	81.739	118.352	118.940	Lbs.	LOAD PIN 1
10	-140.674	-2.592	56.195	20.529	20.692	LBS.	STRAIN GAGE S1
11	-108.965	-42.861	31.862	24.528	49.384	LBS.	STRAIN GAGE S2
12	-4.009	-0.298	5.594	1.806	1.830	MICRO-IN.	STRAIN S3
13	-2.075	47.975	68.014	18.391	51.379	MICRO-IN.	STRAIN S4A
14	-17.436	-12.516	6.350	5.103	13.516	MICRO-IN.	STRAIN S4B
15	1.266	34.975	61.086	16.092	38.499	MICRO-IN.	STRAIN S5A
16	-14.305	-7.965	4.794	4.577	9.187	MICRO-IN.	STRAIN S5B
17	-12.637	29.204	44.184	15.083	32.869	MICRO-IN.	STRAIN S6A
18	-12.872	-8.334	5.924	4.600	9.519	MICRO-IN.	STRAIN S6B
19	-7.213	37.899	53.874	17.092	41.575	MICRO-IN.	STRAIN S7A
20	-13.702	-8.627	3.775	4.341	9.657	MICRO-IN.	STRAIN S7B
21	-16.923	291.231	396.534	109.841	311.256	Lbs.	WINCH CABLE LOAD
31	-0.340	36.362	68.125	21.363	42.174	Degrees	HORSE TILT-METER T1
32	-0.264	36.444	70.151	21.451	42.288	Degrees	GATE TILT-METER T2
33	300.271	300.642	301.281	0.240	300.642	Ft. WATER	U/S POOL
34	294.219	294.713	295.142	0.202	294.713	Ft. WATER	D/S POOL
48	-38.849	-24.842	-16.530	5.546	25.454	Degrees	Winch cable angle

Information File Name: **wicketds5b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/17/00 8:46:33 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #5b Series 1 Condition B

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 down during test.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGR UNITS		
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-5.507	20.069	49.959	7.260	21.342 Lbs.		LOAD PIN 3X
2	-18.411	19.914	122.471	14.426	24.590 Lbs.		LOAD PIN 3Y
3	-28.944	-0.700	40.046	18.971	18.984 Lbs.		LOAD PIN 4X
4	-14.153	58.075	133.275	33.639	67.114 Lbs.		LOAD PIN 4Y
5	-14.516	1.256	10.997	2.882	3.144 Lbs.		LOAD PIN 5X
6	-61.845	33.104	84.045	29.476	44.325 Lbs.		LOAD PIN 5Y
7	-32.164	-11.081	1.270	3.700	11.683 Lbs.		LOAD PIN 6X
8	2.052	8.063	12.310	2.300	8.384 Lbs.		LOAD PIN 6Y
9	-491.997	-9.301	64.219	103.979	104.394 Lbs.		LOAD PIN 1
10	-85.315	-12.617	47.501	17.917	21.913 LBS.		STRAIN GAGE S1
11	-93.867	-45.201	7.065	21.504	50.056 LBS.		STRAIN GAGE S2
12	-3.722	-0.495	3.485	1.321	1.411 MICRO-IN.		STRAIN S3
13	-0.416	43.634	63.056	18.060	47.223 MICRO-IN.		STRAIN S4A
14	-17.164	-11.834	2.958	5.405	13.010 MICRO-IN.		STRAIN S4B
15	2.416	38.287	63.986	18.542	42.541 MICRO-IN.		STRAIN S5A
16	-14.099	-8.590	0.915	4.771	9.826 MICRO-IN.		STRAIN S5B
17	-4.192	33.279	49.798	16.264	37.040 MICRO-IN.		STRAIN S6A
18	-13.572	-9.277	3.780	4.802	10.447 MICRO-IN.		STRAIN S6B
19	-2.916	32.534	49.278	16.060	36.282 MICRO-IN.		STRAIN S7A
20	-12.514	-7.995	1.360	4.196	9.029 MICRO-IN.		STRAIN S7B
21	0.873	294.351	417.681	113.229	315.378 Lbs.		WINCH CABLE LOAD
22	-1.276	-0.004	0.653	0.040	0.040 g.		TOP RIGHT ACC. A1
23	-0.460	-0.001	0.596	0.018	0.018 g.		TOP LEFT ACC. A2
24	-0.639	-0.001	0.293	0.016	0.016 g.		MID. RIGHT ACC. A3
25	-0.580	0.002	0.277	0.016	0.017 g.		MID. LEFT ACC. A4
26	-0.399	0.000	0.297	0.016	0.016 g.		BOTTOM RIGHT ACC. A5
27	-1.344	-0.003	0.675	0.040	0.040 g.		BOTTOM LEFT ACC. A6
28	-0.339	0.000	0.384	0.012	0.012 g.		HORSE ACC. A7X
29	-0.470	0.000	0.262	0.011	0.011 g.		HORSE ACC. A7Y
30	-0.505	-0.003	0.447	0.026	0.026 g.		HORSE ACC. A7Z
31	0.204	35.967	66.686	21.015	41.656 Degrees		HORSE TILT-METER T1
32	0.131	35.845	65.582	21.069	41.578 Degrees		GATE TILT-METER T2
33	299.497	299.758	299.952	0.129	299.758 Ft. WATER		U/S POOL
34	294.217	294.609	294.941	0.216	294.609 Ft. WATER		D/S POOL
40	-0.037	0.124	0.310	0.045	0.132 Volts		P3X
41	-0.112	0.121	0.742	0.088	0.150 Volts		P3Y
42	-0.247	0.004	0.171	0.117	0.117 Volts		P4X
43	-0.088	0.361	0.825	0.209	0.417 Volts		P4Y
44	-0.056	-0.007	0.081	0.016	0.017 Volts		P5X
45	-0.283	0.153	0.388	0.136	0.205 Volts		P5Y
46	-0.205	-0.064	0.015	0.021	0.068 Volts		P6X
47	0.015	0.048	0.071	0.014	0.050 Volts		P6Y
48	-36.202	-23.301	-15.684	5.560	23.955 Degrees		Winch cable angle

Information File Name: **wicketds5c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/17/00 8:55:59 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #5c Series 1 Condition C

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 down during test.

CHAN	STATISTICS					ROOT MEAN ENGR UNITS	TYPE OF GAGE
	MINIMUM	AVERAGE	MAXIMUM	STANDARD	DEVIATION		
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-6.294	20.913	48.779	8.385	22.531	Lbs.	LOAD PIN 3X
2	-22.413	14.233	126.873	13.849	19.859	Lbs.	LOAD PIN 3Y
3	-37.667	-1.313	51.941	23.057	23.095	Lbs.	LOAD PIN 4X
4	-58.578	56.755	124.626	38.633	68.656	Lbs.	LOAD PIN 4Y
5	-20.235	0.886	11.437	3.004	3.132	Lbs.	LOAD PIN 5X
6	-79.816	28.016	96.203	32.926	43.232	Lbs.	LOAD PIN 5Y
7	-31.318	-8.232	1.270	3.395	8.905	Lbs.	LOAD PIN 6X
8	0.821	8.240	12.720	2.657	8.658	Lbs.	LOAD PIN 6Y
9	-420.934	-23.462	69.483	133.399	135.447	Lbs.	LOAD PIN 1
10	-93.127	-7.293	59.220	18.528	19.912	LBS.	STRAIN GAGE S1
11	-83.971	-42.822	36.751	25.676	49.930	LBS.	STRAIN GAGE S2
12	-3.813	-0.472	4.488	1.672	1.738	MICRO-IN.	STRAIN S3
13	-7.255	40.318	55.487	18.476	44.350	MICRO-IN.	STRAIN S4A
14	-15.872	-11.164	4.712	5.781	12.572	MICRO-IN.	STRAIN S4B
15	3.498	34.787	65.429	16.323	38.426	MICRO-IN.	STRAIN S5A
16	-13.553	-7.543	3.008	4.619	8.845	MICRO-IN.	STRAIN S5B
17	-9.928	30.258	45.246	16.065	34.258	MICRO-IN.	STRAIN S6A
18	-11.846	-8.305	5.507	5.091	9.742	MICRO-IN.	STRAIN S6B
19	-8.736	29.373	44.277	15.687	33.300	MICRO-IN.	STRAIN S7A
20	-11.054	-7.203	3.003	4.201	8.338	MICRO-IN.	STRAIN S7B
21	3.085	277.663	371.247	111.148	299.083	Lbs.	WINCH CABLE LOAD
22	-0.872	-0.004	0.951	0.037	0.037	g.	TOP RIGHT ACC. A1
23	-0.577	-0.001	0.792	0.020	0.020	g.	TOP LEFT ACC. A2
24	-1.098	-0.001	0.265	0.019	0.019	g.	MID. RIGHT ACC. A3
25	-1.486	0.003	0.794	0.024	0.024	g.	MID. LEFT ACC. A4
26	-0.469	0.000	0.494	0.018	0.018	g.	BOTTOM RIGHT ACC. A5
27	-1.200	-0.002	0.728	0.039	0.039	g.	BOTTOM LEFT ACC. A6
28	-0.328	-0.001	0.357	0.011	0.012	g.	HORSE ACC. A7X
29	-0.564	0.000	0.375	0.011	0.011	g.	HORSE ACC. A7Y
30	-0.602	-0.003	0.452	0.023	0.024	g.	HORSE ACC. A7Z
31	0.204	36.704	66.661	21.109	42.341	Degrees	HORSE TILT-METER T1
32	0.082	36.586	65.582	21.173	42.271	Degrees	GATE TILT-METER T2
33	299.361	299.729	300.331	0.253	299.729	Ft. WATER	U/S POOL
34	294.054	294.741	295.501	0.403	294.742	Ft. WATER	D/S POOL
40	-0.037	0.130	0.295	0.052	0.140	Volts	P3X
41	-0.137	0.087	0.757	0.084	0.121	Volts	P3Y
42	-0.320	0.008	0.229	0.142	0.142	Volts	P4X
43	-0.361	0.352	0.771	0.240	0.426	Volts	P4Y
44	-0.061	-0.005	0.112	0.017	0.017	Volts	P5X
45	-0.369	0.130	0.461	0.152	0.200	Volts	P5Y
46	-0.173	-0.048	0.007	0.020	0.051	Volts	P6X
47	0.002	0.049	0.078	0.016	0.051	Volts	P6Y
48	-36.374	-23.251	-15.240	5.408	23.872	Degrees	Winch cable angle



Information File Name: **wicketds6a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:45.00

Data Collected on 7/21/00 8:25:48 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #6a Series 1 Condition C 7/21/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 down  
during test.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING	UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-20.456	5.602	42.878	8.778	10.413	Lbs.	LOAD PIN 3X
2	-33.619	7.163	172.499	18.689	20.015	Lbs.	LOAD PIN 3Y
3	-30.133	6.998	61.853	24.390	25.374	Lbs.	LOAD PIN 4X
4	-62.903	39.341	129.343	45.945	60.487	Lbs.	LOAD PIN 4Y
5	-14.077	7.662	21.995	2.967	8.217	Lbs.	LOAD PIN 5X
6	-69.773	9.674	121.046	36.534	37.793	Lbs.	LOAD PIN 5Y
7	-38.089	-19.506	-4.655	4.477	20.013	Lbs.	LOAD PIN 6X
8	-6.975	57.112	100.118	33.812	66.370	Lbs.	LOAD PIN 6Y
9	-414.865	-31.881	78.647	136.927	140.589	Lbs.	LOAD PIN 1
10	-173.357	-46.706	10.633	23.206	52.153	LBS.	STRAIN GAGE S1
11	-88.711	-36.896	33.758	29.377	47.163	LBS.	STRAIN GAGE S2
12	-3.933	-0.255	4.252	1.555	1.576	MICRO-IN.	STRAIN S3
13	-7.331	39.506	62.491	22.961	45.694	MICRO-IN.	STRAIN S4A
14	-17.575	-11.085	4.502	6.813	13.011	MICRO-IN.	STRAIN S4B
15	2.224	34.948	66.348	19.555	40.047	MICRO-IN.	STRAIN S5A
16	-15.523	-7.701	2.545	5.431	9.423	MICRO-IN.	STRAIN S5B
17	-10.316	28.956	47.191	19.296	34.796	MICRO-IN.	STRAIN S6A
18	-13.938	-8.412	5.200	6.082	10.381	MICRO-IN.	STRAIN S6B
19	-8.425	28.938	48.068	18.936	34.583	MICRO-IN.	STRAIN S7A
20	-12.475	-7.142	2.753	5.065	8.756	MICRO-IN.	STRAIN S7B
21	-9.457	266.907	409.508	143.134	302.864	Lbs.	WINCH CABLE LOAD
22	-1.010	-0.058	1.215	0.040	0.071	g.	TOP RIGHT ACC. A1
23	-0.603	-0.059	0.605	0.019	0.062	g.	TOP LEFT ACC. A2
24	-0.836	-0.056	0.784	0.022	0.060	g.	MID. RIGHT ACC. A3
25	-1.083	-0.052	1.342	0.026	0.058	g.	MID. LEFT ACC. A4
26	-0.718	-0.062	0.300	0.018	0.065	g.	BOTTOM RIGHT ACC. A5
27	-1.041	-0.059	0.915	0.042	0.072	g.	BOTTOM LEFT ACC. A6
28	-0.417	-0.039	0.293	0.012	0.041	g.	HORSE ACC. A7X
29	-0.314	-0.040	0.597	0.011	0.042	g.	HORSE ACC. A7Y
30	-0.949	-0.044	0.422	0.024	0.051	g.	HORSE ACC. A7Z
31	-0.744	34.906	67.125	23.030	41.819	Degrees	HORSE TILT-METER T1
32	-0.228	34.922	68.684	22.909	41.766	Degrees	GATE TILT-METER T2
33	299.330	299.699	300.271	0.268	299.699	Ft. WATER	U/S POOL
34	293.873	294.288	294.814	0.300	294.288	Ft. WATER	D/S POOL
40	-0.125	0.036	0.247	0.055	0.066	Volts	P3X
41	-0.212	0.044	1.042	0.114	0.122	Volts	P3Y
42	-0.381	-0.043	0.181	0.150	0.156	Volts	P4X
43	-0.391	0.244	0.801	0.285	0.376	Volts	P4Y
44	-0.117	-0.043	0.076	0.017	0.046	Volts	P5X
45	-0.315	0.048	0.586	0.168	0.174	Volts	P5Y
46	-0.222	-0.113	-0.027	0.026	0.115	Volts	P6X
47	-0.044	0.340	0.593	0.201	0.395	Volts	P6Y
48	-37.040	-24.634	-16.153	5.965	25.346	Degrees	Winch cable angle

Information File Name: **wicketds6b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:45.00

Data Collected on 7/21/00 8:28:10 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #6b Series 1 Condition C 7/21/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 down during test.

CHAN NUM	STATISTICS				ROOT MEAN SQUARE	ENGINEERING UNITS	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION			
1	-15.342	8.307	39.731	8.006	11.538	Lbs.	LOAD PIN 3X
2	-33.219	8.495	158.892	20.719	22.393	Lbs.	LOAD PIN 3Y
3	-53.130	5.868	62.646	23.807	24.519	Lbs.	LOAD PIN 4X
4	-47.570	34.646	117.942	40.574	53.353	Lbs.	LOAD PIN 4Y
5	-7.918	5.278	19.355	2.904	6.024	Lbs.	LOAD PIN 5X
6	-70.831	5.218	119.989	34.307	34.702	Lbs.	LOAD PIN 5Y
7	-39.359	-22.197	-7.195	4.706	22.690	Lbs.	LOAD PIN 6X
8	-6.565	60.198	128.430	33.971	69.121	Lbs.	LOAD PIN 6Y
9	-454.241	-31.945	58.521	138.234	141.877	Lbs.	LOAD PIN 1
10	-163.673	4.263	55.178	23.330	23.716	LBS.	STRAIN GAGE S1
11	-88.711	-37.258	23.882	28.229	46.744	LBS.	STRAIN GAGE S2
12	-2.751	0.181	3.797	1.226	1.239	MICRO-IN.	STRAIN S3
13	-5.779	39.877	65.137	22.776	45.923	MICRO-IN.	STRAIN S4A
14	-18.035	-11.207	15.724	6.756	13.086	MICRO-IN.	STRAIN S4B
15	1.773	35.768	71.308	20.387	41.170	MICRO-IN.	STRAIN S5A
16	-16.794	-7.773	2.273	5.515	9.531	MICRO-IN.	STRAIN S5B
17	-9.317	29.371	50.280	19.482	35.245	MICRO-IN.	STRAIN S6A
18	-14.301	-8.429	5.200	6.055	10.378	MICRO-IN.	STRAIN S6B
19	-7.065	29.221	50.788	19.199	34.964	MICRO-IN.	STRAIN S7A
20	-12.839	-7.162	2.570	5.047	8.762	MICRO-IN.	STRAIN S7B
21	-5.058	265.216	417.206	139.550	299.689	Lbs.	WINCH CABLE LOAD
22	-2.034	-0.058	1.280	0.055	0.080	g.	TOP RIGHT ACC. A1
23	-0.972	-0.059	0.732	0.025	0.064	g.	TOP LEFT ACC. A2
24	-1.044	-0.056	1.175	0.028	0.063	g.	MID. RIGHT ACC. A3
25	-1.293	-0.052	1.892	0.032	0.061	g.	MID. LEFT ACC. A4
26	-0.754	-0.062	0.776	0.022	0.066	g.	BOTTOM RIGHT ACC. A5
27	-1.485	-0.060	1.194	0.053	0.079	g.	BOTTOM LEFT ACC. A6
28	-0.542	-0.038	0.305	0.014	0.041	g.	HORSE ACC. A7X
29	-0.670	-0.040	0.437	0.013	0.042	g.	HORSE ACC. A7Y
30	-1.028	-0.044	0.645	0.029	0.053	g.	HORSE ACC. A7Z
31	-0.398	35.110	67.471	22.985	41.965	Degrees	HORSE TILT-METER T1
32	-0.179	35.147	69.528	22.999	42.003	Degrees	GATE TILT-METER T2
33	299.300	299.684	300.134	0.158	299.684	Ft. WATER	U/S POOL
34	293.819	294.402	295.013	0.355	294.402	Ft. WATER	D/S POOL
40	-0.122	0.053	0.237	0.050	0.073	Volts	P3X
41	-0.205	0.052	0.884	0.126	0.137	Volts	P3Y
42	-0.383	-0.036	0.317	0.147	0.151	Volts	P4X
43	-0.293	0.215	0.735	0.252	0.331	Volts	P4Y
44	-0.120	-0.029	0.042	0.016	0.034	Volts	P5X
45	-0.315	0.026	0.498	0.158	0.160	Volts	P5Y
46	-0.229	-0.128	-0.042	0.027	0.131	Volts	P6X
47	-0.039	0.358	0.740	0.202	0.411	Volts	P6Y
48	-37.829	-24.566	-16.301	6.105	25.314	Degrees	Winch cable angle

Information File Name: **wicketds6c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:45.00

Data Collected on 7/21/00 8:38:09 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #6c Series 1 Condition C 7/21/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 down during test.

STATISTICS						ENGINEERING UNITS	TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN		
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-16.129	11.597	50.746	9.501	14.992	Lbs.	LOAD PIN 3X
2	-49.629	0.637	156.890	25.912	25.920	Lbs.	LOAD PIN 3Y
3	-37.667	4.142	61.060	21.091	21.494	Lbs.	LOAD PIN 4X
4	-34.596	35.854	140.745	41.459	54.812	Lbs.	LOAD PIN 4Y
5	-10.118	3.605	17.156	3.025	4.706	Lbs.	LOAD PIN 5X
6	-89.331	-2.567	139.018	38.522	38.608	Lbs.	LOAD PIN 5Y
7	-40.205	-21.396	-8.887	5.072	21.989	Lbs.	LOAD PIN 6X
8	6.565	66.960	134.175	32.623	74.484	Lbs.	LOAD PIN 6Y
9	-447.241	-27.380	60.271	128.578	131.461	Lbs.	LOAD PIN 1
10	-88.141	23.972	97.786	25.882	35.278	LBS.	STRAIN GAGE S1
11	-94.637	-39.155	17.956	28.202	48.254	LBS.	STRAIN GAGE S2
12	-4.479	0.245	3.433	1.387	1.409	MICRO-IN.	STRAIN S3
13	-5.140	40.420	61.578	22.480	46.251	MICRO-IN.	STRAIN S4A
14	-18.311	-11.953	3.122	6.628	13.667	MICRO-IN.	STRAIN S4B
15	2.134	34.374	63.372	18.168	38.879	MICRO-IN.	STRAIN S5A
16	-14.615	-7.306	2.454	5.071	8.893	MICRO-IN.	STRAIN S5B
17	-8.136	29.243	46.010	18.016	34.347	MICRO-IN.	STRAIN S6A
18	-13.212	-8.338	6.288	5.865	10.194	MICRO-IN.	STRAIN S6B
19	-6.249	28.780	46.526	17.950	33.919	MICRO-IN.	STRAIN S7A
20	-12.110	-6.964	2.662	4.778	8.446	MICRO-IN.	STRAIN S7B
21	-1.759	271.099	399.612	140.369	305.284	Lbs.	WINCH CABLE LOAD
22	-1.390	-0.058	0.524	0.040	0.071	g.	TOP RIGHT ACC. A1
23	-0.728	-0.057	0.342	0.018	0.060	g.	TOP LEFT ACC. A2
24	-0.651	-0.056	0.269	0.017	0.058	g.	MID. RIGHT ACC. A3
25	-0.645	-0.052	0.263	0.016	0.055	g.	MID. LEFT ACC. A4
26	-0.827	-0.061	0.709	0.023	0.065	g.	BOTTOM RIGHT ACC. A5
27	-2.072	-0.058	1.557	0.049	0.076	g.	BOTTOM LEFT ACC. A6
28	-0.617	-0.039	0.492	0.018	0.042	g.	HORSE ACC. A7X
29	-0.371	-0.040	0.263	0.010	0.041	g.	HORSE ACC. A7Y
30	-0.505	-0.045	0.794	0.024	0.051	g.	HORSE ACC. A7Z
31	-0.095	34.332	66.753	22.755	41.188	Degrees	HORSE TILT-METER T1
32	-0.264	34.206	68.822	22.765	41.089	Degrees	GATE TILT-METER T2
33	299.467	299.824	300.377	0.211	299.824	Ft. WATER	U/S POOL
34	293.747	294.366	294.995	0.324	294.367	Ft. WATER	D/S POOL
40	-0.098	0.073	0.327	0.059	0.094	Volts	P3X
41	-0.327	0.004	0.852	0.158	0.158	Volts	P3Y
42	-0.376	-0.026	0.239	0.130	0.132	Volts	P4X
43	-0.215	0.223	0.874	0.257	0.340	Volts	P4Y
44	-0.100	-0.020	0.066	0.017	0.026	Volts	P5X
45	-0.425	-0.010	0.588	0.177	0.177	Volts	P5Y
46	-0.237	-0.123	-0.051	0.029	0.127	Volts	P6X
47	0.039	0.398	0.791	0.194	0.443	Volts	P6Y
48	-36.818	-24.687	-16.597	6.126	25.436	Degrees	Winch cable angle

Information File Name: **wicketds6d.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:45.00

Data Collected on 7/21/00 8:42:42 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #6d Series 1 Condition C 7/21/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 down during test.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING	UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-11.801	8.054	38.944	7.584	11.063	Lbs.	LOAD PIN 3X
2	-50.029	-13.384	109.263	17.566	22.084	Lbs.	LOAD PIN 3Y
3	-30.133	2.609	62.249	22.318	22.470	Lbs.	LOAD PIN 4X
4	-86.491	34.151	123.053	46.997	58.095	Lbs.	LOAD PIN 4Y
5	-16.716	4.783	19.355	3.014	5.653	Lbs.	LOAD PIN 5X
6	-95.145	-11.354	64.487	34.700	36.511	Lbs.	LOAD PIN 5Y
7	-37.243	-18.538	-6.348	4.428	19.060	Lbs.	LOAD PIN 6X
8	-18.054	53.565	113.248	36.099	64.594	Lbs.	LOAD PIN 6Y
9	-458.616	-37.542	66.397	146.500	151.233	Lbs.	LOAD PIN 1
10	-64.900	33.801	84.228	19.848	39.198	LBS.	STRAIN GAGE S1
11	-80.810	-30.799	51.536	31.881	44.328	LBS.	STRAIN GAGE S2
12	-4.843	-0.342	5.798	1.750	1.783	MICRO-IN.	STRAIN S3
13	-5.049	36.373	56.102	20.694	41.848	MICRO-IN.	STRAIN S4A
14	-16.931	-11.023	4.042	6.307	12.700	MICRO-IN.	STRAIN S4B
15	2.134	33.266	72.751	19.300	38.459	MICRO-IN.	STRAIN S5A
16	-14.797	-6.867	1.819	5.177	8.600	MICRO-IN.	STRAIN S5B
17	-7.590	26.943	50.099	18.223	32.527	MICRO-IN.	STRAIN S6A
18	-12.577	-7.381	5.291	5.757	9.361	MICRO-IN.	STRAIN S6B
19	-5.523	26.756	48.612	17.938	32.213	MICRO-IN.	STRAIN S7A
20	-13.751	-6.520	2.479	4.794	8.093	MICRO-IN.	STRAIN S7B
21	-0.660	247.912	372.120	130.992	280.391	Lbs.	WINCH CABLE LOAD
22	-1.096	-0.058	0.716	0.036	0.068	g.	TOP RIGHT ACC. A1
23	-0.455	-0.058	0.270	0.017	0.060	g.	TOP LEFT ACC. A2
24	-1.098	-0.055	0.559	0.020	0.059	g.	MID. RIGHT ACC. A3
25	-1.034	-0.052	0.356	0.021	0.056	g.	MID. LEFT ACC. A4
26	-0.278	-0.061	0.377	0.017	0.063	g.	BOTTOM RIGHT ACC. A5
27	-1.137	-0.059	1.134	0.040	0.071	g.	BOTTOM LEFT ACC. A6
28	-0.394	-0.040	0.201	0.013	0.042	g.	HORSE ACC. A7X
29	-0.516	-0.041	0.246	0.010	0.042	g.	HORSE ACC. A7Y
30	-0.523	-0.046	0.460	0.022	0.051	g.	HORSE ACC. A7Z
31	-0.193	34.944	66.998	23.075	41.875	Degrees	HORSE TILT-METER T1
32	-0.166	34.799	68.773	23.012	41.720	Degrees	GATE TILT-METER T2
33	299.528	299.887	300.422	0.209	299.887	Ft. WATER	U/S POOL
34	293.728	294.264	294.669	0.241	294.264	Ft. WATER	D/S POOL
40	-0.071	0.051	0.251	0.047	0.070	Volts	P3X
41	-0.310	-0.082	0.667	0.107	0.135	Volts	P3Y
42	-0.383	-0.016	0.186	0.137	0.138	Volts	P4X
43	-0.537	0.212	0.764	0.292	0.361	Volts	P4Y
44	-0.103	-0.027	0.105	0.017	0.031	Volts	P5X
45	-0.427	-0.050	0.305	0.159	0.167	Volts	P5Y
46	-0.215	-0.107	-0.037	0.026	0.110	Volts	P6X
47	-0.105	0.319	0.674	0.215	0.384	Volts	P6Y
48	-37.484	-24.603	-15.536	6.222	25.378	Degrees	Winch cable angle

Information File Name: **wicketds3a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/10/00 10:07:57 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #3a Series 1 Condition C

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, single gate operation.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN	ENGINEERING UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-5.507	16.562	40.125	7.012	17.986	Lbs.	LOAD PIN 3X
2	-13.608	33.353	128.874	18.799	38.286	Lbs.	LOAD PIN 3Y
3	-40.442	-4.710	37.270	19.714	20.269	Lbs.	LOAD PIN 4X
4	-11.794	49.184	128.950	20.532	53.297	Lbs.	LOAD PIN 4Y
5	-13.197	1.122	15.836	3.485	3.661	Lbs.	LOAD PIN 5X
6	-30.658	34.456	153.290	16.653	38.270	Lbs.	LOAD PIN 5Y
7	-34.703	-8.416	10.157	4.268	9.437	Lbs.	LOAD PIN 6X
8	-4.103	79.851	164.128	23.373	83.202	Lbs.	LOAD PIN 6Y
9	-551.274	9.157	88.135	56.746	57.480	Lbs.	LOAD PIN 1
10	-94.480	-14.711	36.281	15.863	21.634	LBS.	STRAIN GAGE S1
11	-100.989	-41.002	17.775	16.864	44.335	LBS.	STRAIN GAGE S2
12	-23.113	-6.595	11.454	9.992	11.973	MICRO-IN.	STRAIN S3
13	4.256	44.727	56.008	10.895	46.035	MICRO-IN.	STRAIN S4A
14	-15.806	-12.321	-1.157	3.076	12.699	MICRO-IN.	STRAIN S4B
15	1.615	42.605	67.506	13.199	44.603	MICRO-IN.	STRAIN S5A
16	-15.665	-10.058	-0.186	2.990	10.493	MICRO-IN.	STRAIN S5B
17	2.209	36.773	53.420	10.827	38.334	MICRO-IN.	STRAIN S6A
18	-12.694	-9.912	0.092	2.883	10.323	MICRO-IN.	STRAIN S6B
19	1.560	35.122	50.936	10.321	36.607	MICRO-IN.	STRAIN S7A
20	-13.044	-9.070	0.345	2.585	9.431	MICRO-IN.	STRAIN S7B
21	0.586	309.591	370.987	74.673	318.469	Lbs.	WINCH CABLE LOAD
22	-1.910	0.005	1.395	0.057	0.057	g.	TOP RIGHT ACC. A1
23	-0.711	0.011	0.559	0.025	0.027	g.	TOP LEFT ACC. A2
24	-1.748	-0.007	1.821	0.035	0.036	g.	MID. RIGHT ACC. A3
25	-1.676	0.003	1.937	0.043	0.043	g.	MID. LEFT ACC. A4
26	-0.544	0.022	0.539	0.021	0.030	g.	BOTTOM RIGHT ACC. A5
27	-1.406	0.014	2.699	0.061	0.063	g.	BOTTOM LEFT ACC. A6
28	-0.517	0.019	0.380	0.016	0.025	g.	HORSE ACC. A7X
29	-0.288	0.006	0.304	0.012	0.013	g.	HORSE ACC. A7Y
30	-1.284	0.009	2.242	0.043	0.044	g.	HORSE ACC. A7Z
31	0.008	37.068	67.595	21.375	42.789	Degrees	HORSE TILT-METER T1
32	-0.017	36.929	65.889	21.376	42.669	Degrees	GATE TILT-METER T2
33	299.770	300.047	300.726	0.265	300.047	Ft. WATER	U/S POOL
34	294.452	294.872	295.248	0.197	294.872	Ft. WATER	D/S POOL
40	-0.017	0.051	0.125	0.022	0.056	Volts	P3X
41	-0.049	0.102	0.393	0.057	0.117	Volts	P3Y
42	-0.115	0.014	0.125	0.061	0.062	Volts	P4X
43	-0.034	0.153	0.405	0.064	0.165	Volts	P4Y
44	-0.046	-0.003	0.037	0.010	0.010	Volts	P5X
45	-0.068	0.080	0.369	0.038	0.089	Volts	P5Y
46	-0.093	-0.024	0.029	0.012	0.027	Volts	P6X
47	-0.012	0.237	0.498	0.070	0.247	Volts	P6Y
48	-36.547	-23.141	-15.758	5.867	23.873	Degrees	Winch cable angle

Information File Name: **wicketds3b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/10/00 10:15:00 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #3b Series 1 Condition C

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, single gate operation.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN	ENGINEERING UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-10.228	17.116	44.058	10.010	19.828	Lbs.	LOAD PIN 3X
2	-18.411	28.313	120.069	22.606	36.231	Lbs.	LOAD PIN 3Y
3	-37.270	-3.523	38.063	18.283	18.620	Lbs.	LOAD PIN 4X
4	-32.238	42.647	115.583	30.724	52.562	Lbs.	LOAD PIN 4Y
5	-14.077	1.040	17.596	5.151	5.255	Lbs.	LOAD PIN 5X
6	-28.544	31.979	136.375	24.905	40.533	Lbs.	LOAD PIN 5Y
7	-22.007	-5.944	11.004	4.065	7.201	Lbs.	LOAD PIN 6X
8	-13.130	72.109	134.585	37.210	81.144	Lbs.	LOAD PIN 6Y
9	-539.968	-32.574	125.822	172.682	175.728	Lbs.	LOAD PIN 1
10	-149.126	-10.752	36.281	19.228	22.030	LBS.	STRAIN GAGE S1
11	-87.134	-34.897	33.610	26.773	43.984	LBS.	STRAIN GAGE S2
12	-23.296	-6.580	11.727	10.028	11.994	MICRO-IN.	STRAIN S3
13	-0.846	42.007	58.103	18.172	45.769	MICRO-IN.	STRAIN S4A
14	-16.358	-11.516	21.599	5.973	12.973	MICRO-IN.	STRAIN S4B
15	1.796	38.712	66.420	18.328	42.832	MICRO-IN.	STRAIN S5A
16	-16.303	-8.899	5.278	5.418	10.419	MICRO-IN.	STRAIN S5B
17	-12.800	32.969	50.782	18.948	38.026	MICRO-IN.	STRAIN S6A
18	-13.057	-8.849	5.895	5.668	10.508	MICRO-IN.	STRAIN S6B
19	-10.171	31.643	48.936	17.529	36.174	MICRO-IN.	STRAIN S7A
20	-12.498	-8.106	3.806	4.761	9.401	MICRO-IN.	STRAIN S7B
21	0.586	293.977	383.149	124.060	319.082	Lbs.	WINCH CABLE LOAD
22	-1.647	0.006	2.012	0.058	0.058	g.	TOP RIGHT ACC. A1
23	-0.576	0.011	0.979	0.026	0.029	g.	TOP LEFT ACC. A2
24	-1.696	-0.008	0.685	0.036	0.037	g.	MID. RIGHT ACC. A3
25	-1.719	0.003	1.382	0.044	0.044	g.	MID. LEFT ACC. A4
26	-0.545	0.021	0.642	0.021	0.030	g.	BOTTOM RIGHT ACC. A5
27	-2.135	0.013	1.602	0.057	0.058	g.	BOTTOM LEFT ACC. A6
28	-0.466	0.019	0.536	0.018	0.026	g.	HORSE ACC. A7X
29	-0.421	0.006	0.817	0.014	0.016	g.	HORSE ACC. A7Y
30	-2.238	0.010	1.900	0.046	0.047	g.	HORSE ACC. A7Z
31	0.008	36.637	67.398	21.548	42.504	Degrees	HORSE TILT-METER T1
32	0.008	36.507	65.889	21.548	42.392	Degrees	GATE TILT-METER T2
33	299.998	300.143	300.635	0.151	300.143	Ft. WATER	U/S POOL
34	294.633	294.858	295.085	0.123	294.858	Ft. WATER	D/S POOL
40	-0.073	0.053	0.137	0.031	0.061	Volts	P3X
41	-0.056	0.086	0.405	0.069	0.110	Volts	P3Y
42	-0.115	0.011	0.115	0.056	0.057	Volts	P4X
43	-0.100	0.132	0.391	0.095	0.163	Volts	P4Y
44	-0.066	-0.003	0.037	0.014	0.015	Volts	P5X
45	-0.054	0.075	0.339	0.058	0.094	Volts	P5Y
46	-0.063	-0.017	0.032	0.012	0.021	Volts	P6X
47	-0.037	0.214	0.422	0.111	0.241	Volts	P6Y
48	-36.374	-23.517	-15.536	5.723	24.203	Degrees	Winch cable angle

Information File Name: **wicketds3c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/10/00 10:19:43 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #3c Series 1 Condition C

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, single gate operation.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS		
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-9.441	18.266	42.485	10.781	21.211 Lbs.		LOAD PIN 3X
2	-17.610	27.404	140.881	22.603	35.523 Lbs.		LOAD PIN 3Y
3	-45.200	-6.543	30.926	16.545	17.791 Lbs.		LOAD PIN 4X
4	-59.757	39.336	113.225	33.630	51.752 Lbs.		LOAD PIN 4Y
5	-14.077	1.231	16.716	5.842	5.970 Lbs.		LOAD PIN 5X
6	-31.715	31.064	182.891	26.165	40.615 Lbs.		LOAD PIN 5Y
7	-30.471	-4.400	11.004	4.985	6.649 Lbs.		LOAD PIN 6X
8	-25.440	69.208	159.204	41.293	80.591 Lbs.		LOAD PIN 6Y
9	-588.960	-40.904	106.979	191.131	195.459 Lbs.		LOAD PIN 1
10	-119.851	-8.851	34.330	19.821	21.707 LBS.		STRAIN GAGE S1
11	-87.134	-32.896	45.487	28.295	43.391 LBS.		STRAIN GAGE S2
12	-23.022	-6.435	12.183	10.035	11.922 MICRO-IN.		STRAIN S3
13	-0.300	41.320	58.194	18.228	45.162 MICRO-IN.		STRAIN S4A
14	-16.266	-11.389	4.371	6.101	12.920 MICRO-IN.		STRAIN S4B
15	0.981	39.056	71.217	18.614	43.265 MICRO-IN.		STRAIN S5A
16	-16.303	-8.841	4.731	5.598	10.464 MICRO-IN.		STRAIN S5B
17	-13.164	32.529	56.149	19.443	37.897 MICRO-IN.		STRAIN S6A
18	-13.329	-8.614	6.258	5.827	10.400 MICRO-IN.		STRAIN S6B
19	-10.717	31.348	53.028	18.031	36.164 MICRO-IN.		STRAIN S7A
20	-13.409	-8.022	3.989	4.925	9.413 MICRO-IN.		STRAIN S7B
21	-2.731	290.190	379.832	123.427	315.348 Lbs.		WINCH CABLE LOAD
22	-1.954	0.005	1.257	0.058	0.059 g.		TOP RIGHT ACC. A1
23	-0.988	0.011	0.789	0.027	0.029 g.		TOP LEFT ACC. A2
24	-0.549	-0.007	2.052	0.034	0.035 g.		MID. RIGHT ACC. A3
25	-1.056	0.003	2.566	0.046	0.046 g.		MID. LEFT ACC. A4
26	-0.708	0.021	0.465	0.023	0.032 g.		BOTTOM RIGHT ACC. A5
27	-1.258	0.013	3.216	0.065	0.066 g.		BOTTOM LEFT ACC. A6
28	-0.553	0.019	0.587	0.015	0.025 g.		HORSE ACC. A7X
29	-0.649	0.006	0.421	0.013	0.015 g.		HORSE ACC. A7Y
30	-1.274	0.009	2.113	0.043	0.044 g.		HORSE ACC. A7Z
31	0.008	37.107	67.323	21.462	42.867 Degrees		HORSE TILT-METER T1
32	-0.017	36.977	65.889	21.466	42.757 Degrees		GATE TILT-METER T2
33	299.755	300.097	300.665	0.253	300.097 Ft. WATER		U/S POOL
34	294.289	294.830	295.122	0.215	294.830 Ft. WATER		D/S POOL
40	-0.029	0.056	0.137	0.033	0.066 Volts		P3X
41	-0.051	0.083	0.425	0.069	0.108 Volts		P3Y
42	-0.098	0.020	0.137	0.051	0.055 Volts		P4X
43	-0.186	0.122	0.342	0.104	0.161 Volts		P4Y
44	-0.054	-0.004	0.039	0.016	0.017 Volts		P5X
45	-0.073	0.073	0.422	0.060	0.094 Volts		P5Y
46	-0.071	-0.013	0.032	0.014	0.019 Volts		P6X
47	-0.076	0.206	0.452	0.123	0.240 Volts		P6Y
48	-36.917	-23.410	-15.660	5.695	24.092 Degrees		Winch cable angle

Information File Name: **wicketds33a.inf**

Sample Rate: 1000.000 samples/sec/channel

Length of Time Recorded: 00:00:50.00

Data Collected on 11/1/00 9:22:30 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST 33a 11/01/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1-30 & 33-47 filtered at 200 Hz. Low Pass

Gate #6 @ raised, locked position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 302 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 down  
during test. Corection test for winch cable angle.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING	UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-23.996	-9.707	36.191	11.676	15.184	Lbs.	LOAD PIN 3X
2	-139.680	-87.427	91.253	31.142	92.808	Lbs.	LOAD PIN 3Y
3	-35.684	22.919	92.779	37.891	44.283	Lbs.	LOAD PIN 4X
4	-68.407	79.245	208.758	71.228	106.552	Lbs.	LOAD PIN 4Y
5	-26.394	-3.938	9.238	4.232	5.781	Lbs.	LOAD PIN 5X
6	-91.974	12.624	138.490	47.354	49.008	Lbs.	LOAD PIN 5Y
7	-64.751	-35.186	-5.502	14.020	37.876	Lbs.	LOAD PIN 6X
8	-26.261	60.556	136.226	38.260	71.630	Lbs.	LOAD PIN 6Y
9	-635.993	-66.249	61.509	214.810	224.794	Lbs.	LOAD PIN 1
10	-103.294	30.132	106.035	30.092	42.585	LBS.	STRAIN GAGE S1
11	-126.568	-31.990	84.672	40.905	51.929	LBS.	STRAIN GAGE S2
12	-4.738	-0.619	6.080	2.559	2.633	MICRO-IN.	STRAIN S3
13	-4.384	59.498	91.307	30.742	66.971	MICRO-IN.	STRAIN S4A
14	-24.877	-16.323	12.083	8.726	18.509	MICRO-IN.	STRAIN S4B
15	-5.097	37.078	72.541	19.694	41.984	MICRO-IN.	STRAIN S5A
16	-15.156	-7.870	7.227	6.558	10.244	MICRO-IN.	STRAIN S5B
17	-17.234	31.963	55.166	22.630	39.163	MICRO-IN.	STRAIN S6A
18	-15.298	-8.742	9.683	7.478	11.504	MICRO-IN.	STRAIN S6B
19	-12.952	43.607	68.541	26.613	51.086	MICRO-IN.	STRAIN S7A
20	-17.613	-9.284	5.731	6.569	11.373	MICRO-IN.	STRAIN S7B
21	-19.122	336.476	506.496	160.522	372.805	Lbs.	WINCH CABLE LOAD
31	-0.389	39.110	68.517	21.945	44.846	Degrees	HORSE TILT-METER T1
32	-0.264	39.238	70.347	22.043	45.005	Degrees	GATE TILT-METER T2
33	301.858	302.070	302.226	0.025	302.070	Ft. WATER	U/S POOL
34	294.219	294.860	295.304	0.253	294.860	Ft. WATER	D/S POOL
48	-38.545	-24.201	-16.576	5.337	24.783	Degrees	Winch cable angle



Information File Name: **wicketds33b.inf**

Sample Rate: 1000.000 samples/sec/channel

Length of Time Recorded: 00:00:45.00

Data Collected on 11/1/00 9:26:13 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST 33b 11/01/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1-30 & 33-47 filtered at 200 Hz. Low Pass

Gate #6 @ raised, locked position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 302 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 down  
during test. Correction of winch cable angle.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING	UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-21.636	-7.296	48.779	10.828	13.056	Lbs.	LOAD PIN 3X
2	-138.880	-71.272	86.850	31.770	78.032	Lbs.	LOAD PIN 3Y
3	-28.548	24.521	84.057	34.390	42.237	Lbs.	LOAD PIN 4X
4	-69.586	90.862	199.323	61.199	109.550	Lbs.	LOAD PIN 4Y
5	-29.913	-7.697	3.959	4.082	8.713	Lbs.	LOAD PIN 5X
6	-84.045	32.534	136.375	40.610	52.034	Lbs.	LOAD PIN 5Y
7	-56.287	-37.163	-5.502	12.767	39.295	Lbs.	LOAD PIN 6X
8	-23.388	70.401	139.919	34.512	78.405	Lbs.	LOAD PIN 6Y
9	-565.627	-17.321	50.074	148.844	149.848	Lbs.	LOAD PIN 1
10	-153.134	18.760	86.099	26.261	32.274	LBS.	STRAIN GAGE S1
11	-113.994	-41.171	62.039	35.071	54.084	LBS.	STRAIN GAGE S2
12	-5.225	-0.823	6.202	2.090	2.247	MICRO-IN.	STRAIN S3
13	-4.594	64.620	91.098	24.518	69.115	MICRO-IN.	STRAIN S4A
14	-25.365	-18.236	10.376	6.789	19.459	MICRO-IN.	STRAIN S4B
15	-0.431	43.828	69.147	17.540	47.208	MICRO-IN.	STRAIN S5A
16	-16.129	-9.657	7.349	5.234	10.984	MICRO-IN.	STRAIN S5B
17	-16.723	39.324	59.379	18.552	43.481	MICRO-IN.	STRAIN S6A
18	-16.874	-10.695	7.621	5.861	12.196	MICRO-IN.	STRAIN S6B
19	-12.187	48.054	70.071	20.786	52.357	MICRO-IN.	STRAIN S7A
20	-16.513	-10.727	5.364	5.049	11.856	MICRO-IN.	STRAIN S7B
21	-19.122	376.855	544.982	128.211	398.067	Lbs.	WINCH CABLE LOAD
31	-0.340	37.094	68.615	21.071	42.661	Degrees	HORSE TILT-METER T1
32	-0.215	37.214	70.593	21.155	42.807	Degrees	GATE TILT-METER T2
33	301.922	302.070	302.210	0.027	302.070	Ft. WATER	U/S POOL
34	294.092	294.939	295.522	0.346	294.939	Ft. WATER	D/S POOL
48	-38.123	-24.433	-17.092	5.449	25.033	Degrees	Winch cable angle

Information File Name: **wicketds39a.inf**

Sample Rate: 500.000 samples/sec/channel

Length of Time Recorded: 00:00:50.00

Data Collected on 3/6/01 9:20:36 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST wicketds39a 03/06/01

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1-33 and 40- 47 filtered at 200 Hz. Low Pass

Gate #6 @ down position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 290 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees,

Gates down during test. 7,8

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN	ENGINEERING UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-49.566	-17.103	18.882	10.696	20.172	Lbs.	LOAD PIN 3X
2	-49.228	-3.978	160.893	27.090	27.380	Lbs.	LOAD PIN 3Y
3	-40.046	23.556	107.846	29.852	38.027	Lbs.	LOAD PIN 4X
4	-95.140	36.448	250.431	85.847	93.263	Lbs.	LOAD PIN 4Y
5	-20.675	14.525	42.230	7.509	16.351	Lbs.	LOAD PIN 5X
6	-49.687	20.324	125.275	46.863	51.081	Lbs.	LOAD PIN 5Y
7	-68.137	-29.258	10.580	14.309	32.570	Lbs.	LOAD PIN 6X
8	-62.369	16.293	139.919	45.895	48.701	Lbs.	LOAD PIN 6Y
9	-689.954	-165.534	80.091	302.535	344.861	Lbs.	LOAD PIN 1
10	-184.501	-11.724	48.121	24.765	27.401	LBS.	STRAIN GAGE S1
11	-170.921	-22.526	70.813	50.169	54.994	LBS.	STRAIN GAGE S2
12	-6.602	0.648	8.892	3.277	3.340	MICRO-IN.	STRAIN S3
13	0.260	44.439	80.197	30.511	53.905	MICRO-IN.	STRAIN S4A
14	-30.281	-14.907	14.486	13.710	20.253	MICRO-IN.	STRAIN S4B
15	21.543	49.049	97.737	22.538	53.979	MICRO-IN.	STRAIN S5A
16	-21.613	-9.600	5.296	8.560	12.862	MICRO-IN.	STRAIN S5B
17	-16.394	36.072	72.622	34.666	50.029	MICRO-IN.	STRAIN S6A
18	-23.427	-11.041	9.189	11.737	16.113	MICRO-IN.	STRAIN S6B
19	-17.932	43.932	85.710	40.429	59.704	MICRO-IN.	STRAIN S7A
20	-20.992	-9.810	7.775	9.952	13.974	MICRO-IN.	STRAIN S7B
21	-43.162	357.804	641.587	255.410	439.611	Lbs.	WINCH CABLE LOAD
22	-1.892	-0.045	0.845	0.054	0.070	g.	TOP RIGHT ACC. A1
23	-0.900	-0.056	0.543	0.041	0.070	g.	TOP LEFT ACC. A2
26	-0.864	-0.047	0.568	0.043	0.063	g.	BOTTOM RIGHT ACC. A5
27	-2.069	-0.042	1.472	0.055	0.069	g.	BOTTOM LEFT ACC. A6
31	-0.483	41.207	66.702	22.738	47.064	Degrees	HORSE TILT-METER T1
32	-0.510	41.204	66.369	22.823	47.103	Degrees	GATE TILT-METER T2
33	298.268	299.305	300.609	0.355	299.305	Ft. WATER	U/S POOL
34	288.269	289.872	291.454	0.485	289.872	Ft. WATER	D/S POOL
40	-0.310	-0.106	0.115	0.067	0.125	Volts	P3X
41	-0.300	-0.024	0.945	0.165	0.167	Volts	P3Y
42	-0.669	-0.145	0.242	0.184	0.234	Volts	P4X
43	-0.586	0.226	1.543	0.533	0.579	Volts	P4Y
44	-0.239	-0.081	0.115	0.042	0.091	Volts	P5X
45	-0.234	0.094	0.579	0.216	0.236	Volts	P5Y
46	-0.386	-0.169	0.061	0.083	0.188	Volts	P6X
47	-1.028	0.521	1.687	1.032	1.157	Volts	P6Y
48	-42.090	-25.784	-17.380	5.602	26.386	Degrees	Winch cable angle

Information File Name: **wicketds39b.inf**

Sample Rate: 500.000 samples/sec/channel

Length of Time Recorded: 00:00:45.00

Data Collected on 3/6/01 9:24:11 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST wicketds39b 03/06/01

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1-33 and 40- 47 filtered at 200 Hz. Low Pass

Gate #6 @ down position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 290 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees,

Gates down during test. 7,8

STATISTICS							TYPE OF GAGE
CHAN NUM	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION	ROOT MEAN SQUARE	ENGINEERING UNITS	
1	-51.139	-17.215	16.522	10.047	19.932	Lbs.	LOAD PIN 3X
2	-52.830	-7.164	154.889	26.996	27.930	Lbs.	LOAD PIN 3Y
3	-34.891	30.511	125.688	35.696	46.959	Lbs.	LOAD PIN 4X
4	-98.285	42.936	227.629	88.352	98.233	Lbs.	LOAD PIN 4Y
5	-11.877	13.768	38.271	7.178	15.527	Lbs.	LOAD PIN 5X
6	-63.430	15.629	133.732	49.536	51.943	Lbs.	LOAD PIN 5Y
7	-79.141	-29.861	11.004	13.117	32.615	Lbs.	LOAD PIN 6X
8	-45.135	26.156	151.819	46.632	53.466	Lbs.	LOAD PIN 6Y
9	-689.197	-127.548	88.411	285.864	313.028	Lbs.	LOAD PIN 1
10	-280.859	-10.428	56.880	24.404	26.539	LBS.	STRAIN GAGE S1
11	-181.774	-28.276	69.827	51.713	58.938	LBS.	STRAIN GAGE S2
12	-8.420	0.555	7.756	3.553	3.596	MICRO-IN.	STRAIN S3
13	0.757	49.156	83.348	29.256	57.203	MICRO-IN.	STRAIN S4A
14	-31.428	-17.170	5.679	13.053	21.569	MICRO-IN.	STRAIN S4B
15	22.535	53.790	99.557	23.319	58.628	MICRO-IN.	STRAIN S5A
16	-21.342	-11.159	3.580	8.404	13.969	MICRO-IN.	STRAIN S5B
17	-14.739	41.885	75.050	33.230	53.465	MICRO-IN.	STRAIN S6A
18	-24.243	-12.826	7.147	11.259	17.066	MICRO-IN.	STRAIN S6B
19	-16.267	50.058	89.652	39.160	63.556	MICRO-IN.	STRAIN S7A
20	-20.854	-11.331	5.786	9.623	14.866	MICRO-IN.	STRAIN S7B
21	-25.066	401.044	658.235	247.826	471.438	Lbs.	WINCH CABLE LOAD
22	-1.561	-0.045	0.933	0.053	0.070	g.	TOP RIGHT ACC. A1
23	-0.967	-0.056	0.495	0.041	0.070	g.	TOP LEFT ACC. A2
26	-0.918	-0.047	0.630	0.042	0.063	g.	BOTTOM RIGHT ACC. A5
27	-1.130	-0.043	1.685	0.054	0.069	g.	BOTTOM LEFT ACC. A6
31	-1.285	39.499	67.285	22.431	45.424	Degrees	HORSE TILT-METER T1
32	-1.287	39.490	66.369	22.511	45.455	Degrees	GATE TILT-METER T2
33	298.026	299.454	300.415	0.341	299.454	Ft. WATER	U/S POOL
34	288.881	289.878	291.220	0.433	289.879	Ft. WATER	D/S POOL
40	-0.317	-0.107	0.095	0.062	0.124	Volts	P3X
41	-0.327	-0.044	0.940	0.165	0.171	Volts	P3Y
42	-0.767	-0.188	0.234	0.220	0.289	Volts	P4X
43	-0.615	0.267	1.414	0.549	0.610	Volts	P4Y
44	-0.212	-0.077	0.081	0.040	0.086	Volts	P5X
45	-0.291	0.073	0.625	0.228	0.240	Volts	P5Y
46	-0.459	-0.172	0.059	0.076	0.188	Volts	P6X
47	-0.969	0.699	1.768	1.005	1.224	Volts	P6Y
48	-42.929	-25.821	-17.454	5.772	26.459	Degrees	Winch cable angle

Information File Name: **wicketds39c.inf**

Sample Rate: 500.000 samples/sec/channel

Length of Time Recorded: 00:00:45.00

Data Collected on 3/6/01 9:27:45 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST wicketds39c 03/06/01

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1-33 and 40- 47 filtered at 200 Hz. Low Pass

Gate #6 @ down position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 290 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees,

Gates down during test. 7,8

STATISTICS						ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD			
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-117.227	-28.720	24.389	19.250	34.574 Lbs.		LOAD PIN 3X
2	-54.832	-13.572	107.662	18.255	22.747 Lbs.		LOAD PIN 3Y
3	-169.699	26.121	134.808	36.557	44.930 Lbs.		LOAD PIN 4X
4	-132.489	55.922	282.275	69.460	89.174 Lbs.		LOAD PIN 4Y
5	-69.943	14.555	54.547	9.623	17.448 Lbs.		LOAD PIN 5X
6	-62.902	19.144	146.947	46.644	50.419 Lbs.		LOAD PIN 5Y
7	-71.946	-34.712	79.564	16.781	38.555 Lbs.		LOAD PIN 6X
8	-52.111	27.995	163.718	50.448	57.695 Lbs.		LOAD PIN 6Y
9	-94.644	40.492	123.964	23.895	47.017 Lbs.		LOAD PIN 1
10	-888.207	-205.592	59.800	348.287	404.440 LBS.		STRAIN GAGE S1
11	-388.975	-39.490	85.613	43.987	59.113 LBS.		STRAIN GAGE S2
12	-7.965	0.292	9.347	2.766	2.782 MICRO-IN.		STRAIN S3
13	-25.667	46.634	78.206	30.603	55.779 MICRO-IN.		STRAIN S4A
14	-30.556	-16.146	47.373	14.653	21.804 MICRO-IN.		STRAIN S4B
15	-24.383	46.555	96.910	29.974	55.369 MICRO-IN.		STRAIN S5A
16	-22.065	-5.195	77.443	17.881	18.621 MICRO-IN.		STRAIN S5B
17	-30.136	44.285	71.794	27.131	51.935 MICRO-IN.		STRAIN S6A
18	-23.381	-15.267	53.734	9.605	18.037 MICRO-IN.		STRAIN S6B
19	-23.428	51.918	81.658	31.421	60.686 MICRO-IN.		STRAIN S7A
20	-19.605	-13.535	59.251	9.105	16.312 MICRO-IN.		STRAIN S7B
21	-43.162	385.229	665.473	252.898	460.824 Lbs.		WINCH CABLE LOAD
22	-0.982	-0.016	2.146	0.155	0.156 g.		TOP RIGHT ACC. A1
23	-2.221	-0.056	0.840	0.050	0.075 g.		TOP LEFT ACC. A2
26	-0.605	-0.054	0.435	0.043	0.069 g.		BOTTOM RIGHT ACC. A5
27	-1.270	-0.040	0.779	0.050	0.064 g.		BOTTOM LEFT ACC. A6
31	-0.434	30.804	66.021	17.296	35.328 Degrees		HORSE TILT-METER T1
32	-0.412	37.215	66.369	19.634	42.077 Degrees		GATE TILT-METER T2
33	270.126	292.038	299.947	12.225	292.294 Ft. WATER		U/S POOL
34	289.205	292.401	300.685	4.193	292.431 Ft. WATER		D/S POOL
40	-0.300	-0.104	0.151	0.063	0.121 Volts		P3X
41	-0.339	-0.089	0.642	0.109	0.141 Volts		P3Y
42	-0.825	-0.161	1.042	0.225	0.277 Volts		P4X
43	-0.833	0.347	1.753	0.431	0.554 Volts		P4Y
44	-0.730	-0.147	0.146	0.130	0.196 Volts		P5X
45	-0.291	0.698	2.788	0.977	1.201 Volts		P5Y
46	-0.422	-0.200	0.454	0.097	0.223 Volts		P6X
47	-0.615	0.796	1.699	0.709	1.065 Volts		P6Y
48	-55.259	-33.470	-18.194	12.623	35.771 Degrees		Winch cable angle

Information File Name: **wicketds38a.inf**

Sample Rate: 500.000 samples/sec/channel

Length of Time Recorded: 00:00:45.00

Data Collected on 3/2/01 10:43:56 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST wicketds38a 03/02/01

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1-33 and 40- 47 filtered at 200 Hz. Low Pass

Gate #6 @ down position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 285 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees,  
Gates 7 down during test.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING	UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-28.323	-2.941	34.224	12.857	13.189	Lbs.	LOAD PIN 3X
2	-161.693	-78.319	69.240	36.397	86.363	Lbs.	LOAD PIN 3Y
3	-65.818	43.333	175.250	51.206	67.081	Lbs.	LOAD PIN 4X
4	-160.795	108.491	432.848	136.898	174.674	Lbs.	LOAD PIN 4Y
5	-25.954	11.613	41.350	11.881	16.614	Lbs.	LOAD PIN 5X
6	-132.675	64.312	287.551	118.847	135.132	Lbs.	LOAD PIN 5Y
7	-77.448	-24.060	22.853	20.323	31.494	Lbs.	LOAD PIN 6X
8	-103.401	11.147	208.443	74.554	75.383	Lbs.	LOAD PIN 6Y
9	-788.289	-14.040	69.501	177.334	177.889	Lbs.	LOAD PIN 1
10	-196.181	-15.636	116.253	64.827	66.686	LBS.	STRAIN GAGE S1
11	-258.735	-43.215	121.134	82.395	93.041	LBS.	STRAIN GAGE S2
12	-17.916	-3.637	8.983	5.632	6.704	MICRO-IN.	STRAIN S3
13	8.054	98.598	113.863	30.670	103.258	MICRO-IN.	STRAIN S4A
14	-40.326	-28.717	4.762	10.469	30.566	MICRO-IN.	STRAIN S4B
15	23.748	88.915	114.002	20.419	91.229	MICRO-IN.	STRAIN S5A
16	-27.573	-19.982	4.347	6.664	21.064	MICRO-IN.	STRAIN S5B
17	-17.222	77.320	103.029	27.920	82.207	MICRO-IN.	STRAIN S6A
18	-31.864	-21.737	9.824	9.587	23.757	MICRO-IN.	STRAIN S6B
19	-12.048	79.333	105.140	28.662	84.352	MICRO-IN.	STRAIN S7A
20	-29.179	-20.650	4.584	7.491	21.967	MICRO-IN.	STRAIN S7B
21	-23.619	657.836	1052.726	272.231	711.940	Lbs.	WINCH CABLE LOAD
22	-0.850	-0.044	0.423	0.059	0.074	g.	TOP RIGHT ACC. A1
23	-0.445	-0.050	0.371	0.055	0.074	g.	TOP LEFT ACC. A2
26	-0.334	-0.045	0.353	0.050	0.067	g.	BOTTOM RIGHT ACC. A5
27	-0.841	-0.042	0.261	0.058	0.072	g.	BOTTOM LEFT ACC. A6
31	-0.604	32.255	67.018	20.946	38.459	Degrees	HORSE TILT-METER T1
32	-0.631	32.196	66.369	20.997	38.437	Degrees	GATE TILT-METER T2
33	299.689	300.449	301.319	0.353	300.449	Ft. WATER	U/S POOL
34	283.933	285.160	286.110	0.470	285.160	Ft. WATER	D/S POOL
40	-0.173	-0.018	0.208	0.080	0.082	Volts	P3X
41	-0.994	-0.478	0.420	0.222	0.527	Volts	P3Y
42	-1.069	-0.267	0.398	0.315	0.413	Volts	P4X
43	-1.006	0.674	2.700	0.851	1.085	Volts	P4Y
44	-0.220	-0.065	0.144	0.066	0.092	Volts	P5X
45	-0.576	0.307	1.328	0.539	0.620	Volts	P5Y
46	-0.447	-0.139	0.125	0.117	0.182	Volts	P6X
47	-0.781	1.732	2.429	0.772	1.896	Volts	P6Y
48	-39.994	-27.011	-17.158	6.005	27.670	Degrees	Winch cable angle

Information File Name: **wicketds38b.inf**

Sample Rate: 500.000 samples/sec/channel

Length of Time Recorded: 00:00:50.00

Data Collected on 3/2/01 10:57:19 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST wicketds38b 03/02/01

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1-33 and 40- 47 filtered at 200 Hz. Low Pass

Gate #6 @ down position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 285 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees,

Gates 7 down during test.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN	ENGINEERING UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-38.158	-8.783	30.684	14.085	16.600	Lbs.	LOAD PIN 3X
2	-146.885	-81.037	142.482	26.717	85.327	Lbs.	LOAD PIN 3Y
3	-55.906	26.557	162.562	41.230	49.043	Lbs.	LOAD PIN 4X
4	-131.309	88.818	505.973	159.013	182.137	Lbs.	LOAD PIN 4Y
5	-24.634	14.871	47.069	13.098	19.817	Lbs.	LOAD PIN 5X
6	-119.460	51.930	346.224	129.463	139.490	Lbs.	LOAD PIN 5Y
7	-80.834	-28.325	13.120	20.980	35.248	Lbs.	LOAD PIN 6X
8	-88.629	4.176	212.956	65.304	65.437	Lbs.	LOAD PIN 6Y
9	-789.802	-107.380	78.578	297.275	316.074	Lbs.	LOAD PIN 1
10	-243.874	-8.867	101.653	60.075	60.726	LBS.	STRAIN GAGE S1
11	-283.401	-31.122	113.240	88.765	94.062	LBS.	STRAIN GAGE S2
12	-21.597	-2.257	8.983	6.535	6.914	MICRO-IN.	STRAIN S3
13	10.376	89.545	113.863	41.240	98.585	MICRO-IN.	STRAIN S4A
14	-43.583	-26.445	3.569	15.085	30.445	MICRO-IN.	STRAIN S4B
15	19.558	65.108	110.418	21.804	68.661	MICRO-IN.	STRAIN S5A
16	-23.374	-14.811	5.476	9.102	17.385	MICRO-IN.	STRAIN S5B
17	-16.946	56.986	85.756	36.060	67.436	MICRO-IN.	STRAIN S6A
18	-30.685	-17.387	8.826	12.965	21.689	MICRO-IN.	STRAIN S6B
19	-12.103	74.378	114.410	43.763	86.298	MICRO-IN.	STRAIN S7A
20	-28.485	-17.435	5.278	10.915	20.570	MICRO-IN.	STRAIN S7B
21	-35.200	552.252	1046.935	329.959	643.315	Lbs.	WINCH CABLE LOAD
22	-1.635	-0.044	0.822	0.064	0.077	g.	TOP RIGHT ACC. A1
23	-0.575	-0.052	0.684	0.055	0.076	g.	TOP LEFT ACC. A2
26	-0.380	-0.045	0.274	0.050	0.067	g.	BOTTOM RIGHT ACC. A5
27	-1.766	-0.042	0.900	0.062	0.075	g.	BOTTOM LEFT ACC. A6
31	-0.483	36.485	67.431	22.566	42.899	Degrees	HORSE TILT-METER T1
32	-0.510	36.443	66.369	22.639	42.903	Degrees	GATE TILT-METER T2
33	299.705	300.498	301.481	0.388	300.498	Ft. WATER	U/S POOL
34	284.149	285.105	286.146	0.416	285.105	Ft. WATER	D/S POOL
40	-0.237	-0.055	0.188	0.087	0.103	Volts	P3X
41	-0.894	-0.494	0.859	0.163	0.520	Volts	P3Y
42	-1.001	-0.164	0.344	0.254	0.302	Volts	P4X
43	-0.813	0.552	3.149	0.988	1.132	Volts	P4Y
44	-0.259	-0.083	0.132	0.073	0.110	Volts	P5X
45	-0.520	0.248	1.606	0.592	0.642	Volts	P5Y
46	-0.466	-0.164	0.073	0.121	0.204	Volts	P6X
47	-0.908	1.279	2.080	1.047	1.652	Volts	P6Y
48	-41.498	-26.466	-17.503	6.074	27.154	Degrees	Winch cable angle

Information File Name: **wicketds38c.inf**

Sample Rate: 500.000 samples/sec/channel

Length of Time Recorded: 00:00:50.00

Data Collected on 3/2/01 11:01:11 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST wicketds38c 03/02/01

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1-33 and 40- 47 filtered at 200 Hz. Low Pass

Gate #6 @ down position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 285 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees,

Gates 7 down during test.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING	UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-40.911	-10.248	30.290	15.480	18.565	Lbs.	LOAD PIN 3X
2	-140.881	-74.747	131.676	28.518	80.003	Lbs.	LOAD PIN 3Y
3	-57.888	29.193	171.285	53.390	60.850	Lbs.	LOAD PIN 4X
4	-149.394	73.688	391.175	138.433	156.824	Lbs.	LOAD PIN 4Y
5	-26.833	12.980	41.790	11.333	17.231	Lbs.	LOAD PIN 5X
6	-123.161	26.961	245.264	114.145	117.286	Lbs.	LOAD PIN 5Y
7	-91.414	-32.669	12.273	24.744	40.982	Lbs.	LOAD PIN 6X
8	-85.757	14.182	185.875	69.715	71.143	Lbs.	LOAD PIN 6Y
9	-815.521	-130.910	74.039	321.357	346.999	Lbs.	LOAD PIN 1
10	-379.164	-5.497	98.733	57.289	57.552	LBS.	STRAIN GAGE S1
11	-239.001	-28.757	117.187	84.695	89.444	LBS.	STRAIN GAGE S2
12	-16.371	-1.169	9.619	5.627	5.747	MICRO-IN.	STRAIN S3
13	9.492	87.027	113.863	42.923	97.037	MICRO-IN.	STRAIN S4A
14	-43.262	-25.597	4.166	15.791	30.076	MICRO-IN.	STRAIN S4B
15	19.062	63.807	113.891	23.766	68.089	MICRO-IN.	STRAIN S5A
16	-23.916	-14.079	6.063	9.697	17.095	MICRO-IN.	STRAIN S5B
17	-17.939	55.048	89.122	38.259	67.037	MICRO-IN.	STRAIN S6A
18	-31.365	-16.841	9.098	13.655	21.681	MICRO-IN.	STRAIN S6B
19	-12.659	71.757	114.410	45.773	85.113	MICRO-IN.	STRAIN S7A
20	-29.040	-16.588	5.786	11.387	20.120	MICRO-IN.	STRAIN S7B
21	-27.238	539.861	1041.868	338.481	637.197	Lbs.	WINCH CABLE LOAD
22	-1.841	-0.044	1.171	0.063	0.077	g.	TOP RIGHT ACC. A1
23	-0.563	-0.052	0.543	0.052	0.074	g.	TOP LEFT ACC. A2
26	-0.395	-0.045	0.345	0.049	0.067	g.	BOTTOM RIGHT ACC. A5
27	-1.700	-0.042	0.585	0.060	0.073	g.	BOTTOM LEFT ACC. A6
31	-0.507	37.435	67.552	22.757	43.810	Degrees	HORSE TILT-METER T1
32	-0.558	37.399	66.369	22.842	43.823	Degrees	GATE TILT-METER T2
33	299.527	300.465	301.675	0.532	300.466	Ft. WATER	U/S POOL
34	284.599	285.287	286.002	0.316	285.288	Ft. WATER	D/S POOL
40	-0.256	-0.064	0.215	0.096	0.115	Volts	P3X
41	-0.867	-0.456	0.813	0.174	0.488	Volts	P3Y
42	-1.050	-0.180	0.359	0.329	0.375	Volts	P4X
43	-0.930	0.458	2.429	0.860	0.974	Volts	P4Y
44	-0.225	-0.072	0.154	0.063	0.096	Volts	P5X
45	-0.571	0.134	1.123	0.522	0.539	Volts	P5Y
46	-0.532	-0.189	0.068	0.143	0.237	Volts	P6X
47	-0.901	1.191	2.153	1.095	1.618	Volts	P6Y
48	-41.104	-26.297	-17.528	5.984	26.969	Degrees	Winch cable angle

Information File Name: **wicketds38d.inf**

Sample Rate: 500.000 samples/sec/channel

Length of Time Recorded: 00:00:45.00

Data Collected on 3/6/01 9:34:04 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST wicketds38d 03/06/01

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1-33 and 40- 47 filtered at 200 Hz. Low Pass

Gate #6 @ down position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 285 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees,

Gates down during test. 7,8

STATISTICS						TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
1	-49.172	-13.036	31.077	17.041	21.456 Lbs.	LOAD PIN 3X
2	-166.096	-33.215	140.881	29.925	44.707 Lbs.	LOAD PIN 3Y
3	-70.972	20.949	145.513	36.605	42.176 Lbs.	LOAD PIN 4X
4	-158.043	73.482	551.970	166.043	181.576 Lbs.	LOAD PIN 4Y
5	-17.156	18.750	47.069	11.120	21.799 Lbs.	LOAD PIN 5X
6	-121.575	39.791	290.722	102.218	109.690 Lbs.	LOAD PIN 5Y
7	-82.950	-30.220	18.198	22.503	37.678 Lbs.	LOAD PIN 6X
8	-96.015	15.541	195.312	69.460	71.177 Lbs.	LOAD PIN 6Y
9	-801.149	-112.366	74.039	304.231	324.319 Lbs.	LOAD PIN 1
10	-241.927	-8.713	86.080	47.125	47.923 LBS.	STRAIN GAGE S1
11	-305.108	-39.168	111.267	89.229	97.447 LBS.	STRAIN GAGE S2
12	-17.825	-0.938	8.347	6.321	6.390 MICRO-IN.	STRAIN S3
13	2.139	68.338	113.752	36.037	77.258 MICRO-IN.	STRAIN S4A
14	-42.574	-24.777	8.661	15.467	29.208 MICRO-IN.	STRAIN S4B
15	31.467	67.175	114.002	19.860	70.050 MICRO-IN.	STRAIN S5A
16	-24.819	-15.055	5.160	8.397	17.238 MICRO-IN.	STRAIN S5B
17	-16.118	56.823	82.500	35.365	66.930 MICRO-IN.	STRAIN S6A
18	-30.821	-17.998	9.688	12.801	22.086 MICRO-IN.	STRAIN S6B
19	-18.265	67.042	105.362	42.546	79.403 MICRO-IN.	STRAIN S7A
20	-24.831	-15.487	7.868	10.276	18.586 MICRO-IN.	STRAIN S7B
21	-35.924	532.628	978.171	306.298	614.420 Lbs.	WINCH CABLE LOAD
22	-1.748	-0.045	1.051	0.054	0.071 g.	TOP RIGHT ACC. A1
23	-0.630	-0.056	0.385	0.040	0.069 g.	TOP LEFT ACC. A2
26	-0.303	-0.047	0.222	0.040	0.062 g.	BOTTOM RIGHT ACC. A5
27	-1.419	-0.043	0.455	0.050	0.066 g.	BOTTOM LEFT ACC. A6
31	-0.410	37.096	67.406	22.535	43.404 Degrees	HORSE TILT-METER T1
32	-0.388	37.071	66.369	22.605	43.420 Degrees	GATE TILT-METER T2
33	298.413	299.483	301.319	0.474	299.483 Ft. WATER	U/S POOL
34	283.645	285.177	286.272	0.401	285.178 Ft. WATER	D/S POOL
40	-0.303	-0.081	0.190	0.106	0.133 Volts	P3X
41	-1.018	-0.203	0.864	0.183	0.273 Volts	P3Y
42	-0.903	-0.129	0.435	0.225	0.260 Volts	P4X
43	-0.984	0.457	3.423	1.032	1.128 Volts	P4Y
44	-0.269	-0.104	0.090	0.062	0.121 Volts	P5X
45	-0.547	0.187	1.340	0.470	0.505 Volts	P5Y
46	-0.476	-0.174	0.107	0.130	0.217 Volts	P6X
47	-0.881	1.210	2.036	1.015	1.579 Volts	P6Y
48	-41.868	-26.170	-17.454	5.995	26.848 Degrees	Winch cable angle



Information File Name: **wicketds38e.inf**

Sample Rate: 500.000 samples/sec/channel

Length of Time Recorded: 00:00:45.00

Data Collected on 3/6/01 9:37:55 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST wicketds38e 03/06/01

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1-33 and 40- 47 filtered at 200 Hz. Low Pass

Gate #6 @ down position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 285 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees,

Gates down during test. 7,8

STATISTICS						ENGINEERING UNITS	TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN		
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-60.187	-10.600	25.570	16.676	19.759	Lbs.	LOAD PIN 3X
2	-194.112	-38.442	145.684	38.459	54.377	Lbs.	LOAD PIN 3Y
3	-69.386	23.941	135.204	37.475	44.470	Lbs.	LOAD PIN 4X
4	-149.787	77.424	573.200	171.282	187.968	Lbs.	LOAD PIN 4Y
5	-14.516	24.369	65.544	14.112	28.160	Lbs.	LOAD PIN 5X
6	-112.589	32.097	255.307	95.735	100.972	Lbs.	LOAD PIN 5Y
7	-78.718	-29.808	17.775	20.918	36.415	Lbs.	LOAD PIN 6X
8	-88.219	19.567	199.416	69.688	72.383	Lbs.	LOAD PIN 6Y
9	-793.584	-124.366	69.501	308.360	332.495	Lbs.	LOAD PIN 1
10	-198.128	-1.714	83.160	42.265	42.299	LBS.	STRAIN GAGE S1
11	-326.815	-41.107	120.147	94.260	102.834	LBS.	STRAIN GAGE S2
12	-19.052	-0.497	9.029	5.957	5.977	MICRO-IN.	STRAIN S3
13	2.250	66.907	110.767	37.056	76.483	MICRO-IN.	STRAIN S4A
14	-41.473	-24.260	7.010	15.812	28.958	MICRO-IN.	STRAIN S4B
15	31.908	65.294	114.002	19.950	68.274	MICRO-IN.	STRAIN S5A
16	-25.225	-14.509	4.799	8.494	16.813	MICRO-IN.	STRAIN S5B
17	-15.677	54.621	80.679	35.849	65.335	MICRO-IN.	STRAIN S6A
18	-29.641	-17.375	9.551	13.029	21.717	MICRO-IN.	STRAIN S6B
19	-18.154	64.928	99.977	43.662	78.243	MICRO-IN.	STRAIN S7A
20	-24.692	-14.831	7.914	10.531	18.189	MICRO-IN.	STRAIN S7B
21	-30.133	513.956	955.732	305.753	598.026	Lbs.	WINCH CABLE LOAD
22	-1.079	-0.045	0.677	0.050	0.067	g.	TOP RIGHT ACC. A1
23	-0.445	-0.054	0.249	0.039	0.066	g.	TOP LEFT ACC. A2
26	-0.267	-0.047	0.146	0.039	0.061	g.	BOTTOM RIGHT ACC. A5
27	-1.064	-0.043	0.422	0.047	0.064	g.	BOTTOM LEFT ACC. A6
31	-0.361	37.678	67.382	22.623	43.948	Degrees	HORSE TILT-METER T1
32	-0.364	37.657	66.369	22.699	43.969	Degrees	GATE TILT-METER T2
33	297.896	299.363	301.206	0.495	299.364	Ft. WATER	U/S POOL
34	283.537	285.182	286.470	0.335	285.182	Ft. WATER	D/S POOL
40	-0.369	-0.066	0.156	0.104	0.123	Volts	P3X
41	-1.199	-0.234	0.896	0.235	0.332	Volts	P3Y
42	-0.837	-0.147	0.432	0.231	0.274	Volts	P4X
43	-0.940	0.481	3.562	1.065	1.168	Volts	P4Y
44	-0.359	-0.135	0.078	0.078	0.156	Volts	P5X
45	-0.513	0.151	1.179	0.440	0.465	Volts	P5Y
46	-0.449	-0.172	0.105	0.121	0.210	Volts	P6X
47	-0.864	1.154	2.021	1.044	1.556	Volts	P6Y
48	-41.572	-26.031	-17.405	6.068	26.729	Degrees	Winch cable angle

Information File Name: **wicketds38f.inf**

Sample Rate: 500.000 samples/sec/channel

Length of Time Recorded: 00:00:45.00

Data Collected on 3/6/01 9:42:38 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST wicketds38f 03/06/01

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1-33 and 40- 47 filtered at 200 Hz. Low Pass

Gate #6 @ down position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 285 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees,

Gates down during test. 7,8

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING	UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-53.499	-13.996	26.750	18.089	22.872	Lbs.	LOAD PIN 3X
2	-197.314	-34.750	297.772	43.325	55.539	Lbs.	LOAD PIN 3Y
3	-89.211	24.306	158.201	47.114	53.014	Lbs.	LOAD PIN 4X
4	-172.982	79.125	576.345	175.750	192.740	Lbs.	LOAD PIN 4Y
5	-17.156	21.425	61.585	12.711	24.912	Lbs.	LOAD PIN 5X
6	-122.632	40.281	351.510	108.725	115.947	Lbs.	LOAD PIN 5Y
7	-90.567	-31.764	20.737	21.902	38.583	Lbs.	LOAD PIN 6X
8	-102.990	26.829	201.878	71.194	76.081	Lbs.	LOAD PIN 6Y
9	-767.866	-113.497	85.386	298.887	319.710	Lbs.	LOAD PIN 1
10	-281.833	-5.608	114.306	46.524	46.861	LBS.	STRAIN GAGE S1
11	-303.135	-42.781	132.974	93.774	103.071	LBS.	STRAIN GAGE S2
12	-20.961	-0.866	9.483	6.516	6.573	MICRO-IN.	STRAIN S3
13	4.516	69.971	113.863	37.651	79.458	MICRO-IN.	STRAIN S4A
14	-43.399	-25.226	5.037	15.820	29.776	MICRO-IN.	STRAIN S4B
15	31.963	65.103	114.002	18.717	67.740	MICRO-IN.	STRAIN S5A
16	-25.090	-14.806	2.632	8.291	16.969	MICRO-IN.	STRAIN S5B
17	-14.352	55.316	84.431	35.154	65.541	MICRO-IN.	STRAIN S6A
18	-31.411	-17.842	7.329	12.952	22.047	MICRO-IN.	STRAIN S6B
19	-16.489	68.187	111.524	44.282	81.304	MICRO-IN.	STRAIN S7A
20	-26.450	-15.403	5.694	10.525	18.655	MICRO-IN.	STRAIN S7B
21	-18.552	531.458	1012.915	317.439	619.044	Lbs.	WINCH CABLE LOAD
22	-1.929	-0.045	1.360	0.057	0.073	g.	TOP RIGHT ACC. A1
23	-0.491	-0.053	0.459	0.041	0.067	g.	TOP LEFT ACC. A2
26	-0.456	-0.046	0.358	0.040	0.061	g.	BOTTOM RIGHT ACC. A5
27	-1.653	-0.043	0.826	0.053	0.069	g.	BOTTOM LEFT ACC. A6
31	-0.507	37.336	67.965	22.661	43.675	Degrees	HORSE TILT-METER T1
32	-0.607	37.313	66.369	22.726	43.689	Degrees	GATE TILT-METER T2
33	298.316	299.452	300.528	0.419	299.452	Ft. WATER	U/S POOL
34	283.285	284.978	286.542	0.708	284.978	Ft. WATER	D/S POOL
40	-0.344	-0.087	0.168	0.112	0.142	Volts	P3X
41	-1.226	-0.212	1.819	0.264	0.339	Volts	P3Y
42	-0.972	-0.150	0.552	0.290	0.327	Volts	P4X
43	-1.084	0.492	3.584	1.092	1.198	Volts	P4Y
44	-0.334	-0.119	0.093	0.071	0.138	Volts	P5X
45	-0.554	0.189	1.614	0.500	0.534	Volts	P5Y
46	-0.515	-0.183	0.125	0.126	0.223	Volts	P6X
47	-0.823	1.196	2.056	1.027	1.576	Volts	P6Y
48	-40.561	-26.133	-17.577	6.074	26.830	Degrees	Winch cable angle

Information File Name: **wicketds7a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/24/00 10:51:41 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Dry test

\*\*\* TEST #7a Series 2a Condition A 7/24/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 0.0 ft. Head water & 0.0 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 1,2,3,12 down during test.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING	UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-67.268	-17.320	0.787	5.549	18.187	Lbs.	LOAD PIN 3X
2	-64.837	4.663	156.490	21.453	21.954	Lbs.	LOAD PIN 3Y
3	-10.705	20.355	78.506	21.255	29.430	Lbs.	LOAD PIN 4X
4	-38.135	38.422	210.724	25.166	45.930	Lbs.	LOAD PIN 4Y
5	-1.760	45.005	81.820	17.054	48.128	Lbs.	LOAD PIN 5X
6	-83.517	13.031	232.578	29.950	32.662	Lbs.	LOAD PIN 5Y
7	-72.793	-41.978	-7.195	10.206	43.200	Lbs.	LOAD PIN 6X
8	-51.700	30.999	184.234	27.267	41.285	Lbs.	LOAD PIN 6Y
9	-200.051	24.731	84.560	11.027	27.078	Lbs.	LOAD PIN 1
10	-546.039	-28.104	38.898	20.515	34.795	LBS.	STRAIN GAGE S1
11	-158.559	-27.472	24.940	16.112	31.848	LBS.	STRAIN GAGE S2
12	-6.807	-1.969	3.407	1.100	2.256	MICRO-IN.	STRAIN S3
13	-26.832	-10.033	10.694	7.816	12.719	MICRO-IN.	STRAIN S4A
14	-1.856	4.087	31.082	2.307	4.693	MICRO-IN.	STRAIN S4B
15	-19.530	-0.566	21.480	7.956	7.976	MICRO-IN.	STRAIN S5A
16	-4.871	0.930	12.229	2.002	2.208	MICRO-IN.	STRAIN S5B
17	-22.526	-8.981	9.186	6.824	11.279	MICRO-IN.	STRAIN S6A
18	-3.022	2.658	5.529	1.989	3.320	MICRO-IN.	STRAIN S6B
19	-15.462	-2.965	14.953	5.724	6.446	MICRO-IN.	STRAIN S7A
20	-4.983	0.237	3.405	1.664	1.681	MICRO-IN.	STRAIN S7B
21	-12.373	112.658	325.084	59.943	127.613	Lbs.	WINCH CABLE LOAD
22	-1.537	-0.054	1.187	0.042	0.069	g.	TOP RIGHT ACC. A1
23	-2.202	-0.054	1.690	0.062	0.082	g.	TOP LEFT ACC. A2
24	-1.596	-0.053	0.684	0.039	0.066	g.	MID. RIGHT ACC. A3
25	-4.771	-0.663	4.769	2.249	2.344	g.	MID. LEFT ACC. A4
26	-1.632	-0.033	1.338	0.087	0.093	g.	BOTTOM RIGHT ACC. A5
27	-3.098	-0.054	2.294	0.076	0.093	g.	BOTTOM LEFT ACC. A6
28	-1.106	-0.034	0.640	0.026	0.043	g.	HORSE ACC. A7X
29	-0.981	-0.030	1.091	0.029	0.042	g.	HORSE ACC. A7Y
30	-1.866	-0.040	1.883	0.048	0.062	g.	HORSE ACC. A7Z
31	-0.144	40.891	68.664	25.421	48.149	Degrees	HORSE TILT-METER T1
32	-25.556	-18.509	0.130	6.452	19.601	Degrees	GATE TILT-METER T2
33	280.223	280.292	280.390	0.026	280.292	Ft. WATER	U/S POOL
34	273.938	273.986	274.029	0.013	273.986	Ft. WATER	D/S POOL
40	-0.413	-0.107	0.005	0.034	0.112	Volts	P3X
41	-0.398	0.028	0.918	0.131	0.134	Volts	P3Y
42	-0.486	-0.125	0.063	0.131	0.181	Volts	P4X
43	-0.237	0.238	1.187	0.156	0.285	Volts	P4Y
44	-0.432	-0.250	0.010	0.095	0.267	Volts	P5X
45	-0.386	0.060	0.916	0.138	0.150	Volts	P5Y
46	-0.403	-0.242	-0.042	0.059	0.249	Volts	P6X
47	-0.308	0.184	1.155	0.162	0.246	Volts	P6Y
48	-63.329	-39.813	-28.730	9.352	40.897	Degrees	Winch cable angle

Information File Name: **wicketds7b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/24/00 10:53:28 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Dry test

\*\*\* TEST #7b Series 2a Condition A 7/24/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 0.0 ft. Head water & 0.0 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 1,2,3,12 down during test.

CHAN	STATISTICS					ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
	MINIMUM	AVERAGE	MAXIMUM	STANDARD	DEVIATION		
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	DEVIATION	SQUARE	
1	-51.926	-19.692	-0.787	6.425	20.713	Lbs.	LOAD PIN 3X
2	-55.232	9.097	116.467	21.422	23.273	Lbs.	LOAD PIN 3Y
3	-35.288	15.328	80.092	26.608	30.708	Lbs.	LOAD PIN 4X
4	-55.433	46.241	273.626	31.419	55.905	Lbs.	LOAD PIN 4Y
5	-2.199	45.686	66.864	17.643	48.975	Lbs.	LOAD PIN 5X
6	-80.874	14.106	187.119	29.509	32.707	Lbs.	LOAD PIN 5Y
7	-72.793	-41.024	-8.887	10.146	42.260	Lbs.	LOAD PIN 6X
8	-52.111	30.505	212.546	27.895	41.336	Lbs.	LOAD PIN 6Y
9	-94.964	24.870	54.786	11.884	27.563	Lbs.	LOAD PIN 1
10	-134.633	-22.966	40.848	19.056	29.842	LBS.	STRAIN GAGE S1
11	-196.049	-21.276	26.913	15.933	26.581	LBS.	STRAIN GAGE S2
12	-11.549	-2.805	1.857	1.136	3.026	MICRO-IN.	STRAIN S3
13	-27.016	-9.815	11.522	8.124	12.742	MICRO-IN.	STRAIN S4A
14	-2.508	3.688	9.960	2.299	4.346	MICRO-IN.	STRAIN S4B
15	-24.196	-0.195	23.275	8.301	8.303	MICRO-IN.	STRAIN S5A
16	-5.326	0.523	6.499	2.028	2.094	MICRO-IN.	STRAIN S5B
17	-19.676	-9.178	8.911	6.832	11.442	MICRO-IN.	STRAIN S6A
18	-3.022	2.674	5.713	1.984	3.329	MICRO-IN.	STRAIN S6B
19	-15.100	-3.085	13.957	5.578	6.375	MICRO-IN.	STRAIN S7A
20	-5.165	0.111	3.132	1.666	1.670	MICRO-IN.	STRAIN S7B
21	-0.243	111.468	211.496	61.246	127.185	Lbs.	WINCH CABLE LOAD
22	-1.315	-0.055	1.427	0.041	0.069	g.	TOP RIGHT ACC. A1
23	-3.301	-0.054	3.114	0.068	0.087	g.	TOP LEFT ACC. A2
24	-1.002	-0.053	0.541	0.031	0.062	g.	MID. RIGHT ACC. A3
25	-4.771	-0.510	4.769	2.453	2.505	g.	MID. LEFT ACC. A4
26	-1.717	-0.026	2.511	0.098	0.101	g.	BOTTOM RIGHT ACC. A5
27	-2.081	-0.055	1.852	0.059	0.081	g.	BOTTOM LEFT ACC. A6
28	-0.903	-0.025	1.172	0.025	0.035	g.	HORSE ACC. A7X
29	-0.899	-0.025	0.777	0.025	0.035	g.	HORSE ACC. A7Y
30	-1.357	-0.034	1.336	0.039	0.052	g.	HORSE ACC. A7Z
31	-0.193	40.602	68.468	25.418	47.902	Degrees	HORSE TILT-METER T1
32	-25.606	-18.283	0.130	6.449	19.387	Degrees	GATE TILT-METER T2
33	280.268	280.344	280.420	0.023	280.344	Ft. WATER	U/S POOL
34	273.920	273.984	274.047	0.013	273.984	Ft. WATER	D/S POOL
40	-0.320	-0.122	-0.002	0.040	0.128	Volts	P3X
41	-0.337	0.055	0.674	0.130	0.142	Volts	P3Y
42	-0.493	-0.095	0.215	0.164	0.189	Volts	P4X
43	-0.347	0.287	1.758	0.195	0.347	Volts	P4Y
44	-0.396	-0.253	0.010	0.098	0.272	Volts	P5X
45	-0.376	0.065	0.845	0.136	0.151	Volts	P5Y
46	-0.430	-0.237	-0.054	0.059	0.244	Volts	P6X
47	-0.310	0.181	1.340	0.166	0.246	Volts	P6Y
48	-63.244	-40.268	-28.815	9.423	41.356	Degrees	Winch cable angle

Information File Name: **wicketds8a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/24/00 11:13:38 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #8a Series 2a Condition A 7/24/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 295 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 1,2,3,12 down during test.

CHAN	STATISTICS					ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
	MINIMUM	AVERAGE	MAXIMUM	STANDARD	DEVIATION		
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-75.922	-16.364	0.000	4.845	17.066 Lbs.		LOAD PIN 3X
2	-46.027	8.254	75.243	19.357	21.043 Lbs.		LOAD PIN 3Y
3	-1.189	15.848	62.646	15.975	22.502 Lbs.		LOAD PIN 4X
4	-55.433	32.458	110.080	24.348	40.575 Lbs.		LOAD PIN 4Y
5	-6.598	36.213	69.503	15.198	39.273 Lbs.		LOAD PIN 5X
6	-67.659	9.069	124.218	25.088	26.677 Lbs.		LOAD PIN 5Y
7	-66.868	-37.053	-8.041	9.770	38.319 Lbs.		LOAD PIN 6X
8	-52.931	23.491	86.167	22.023	32.201 Lbs.		LOAD PIN 6Y
9	-193.921	21.781	78.430	8.255	23.293 Lbs.		LOAD PIN 1
10	-423.202	-20.271	31.099	16.245	25.977 LBS.		STRAIN GAGE S1
11	-79.635	-24.154	28.886	13.531	27.686 LBS.		STRAIN GAGE S2
12	-5.895	-1.268	4.866	0.994	1.612 MICRO-IN.		STRAIN S3
13	-23.153	-7.540	14.465	6.137	9.722 MICRO-IN.		STRAIN S4A
14	-3.252	2.705	27.918	1.829	3.265 MICRO-IN.		STRAIN S4B
15	-21.055	-0.142	22.557	6.418	6.420 MICRO-IN.		STRAIN S5A
16	-4.962	0.752	3.861	1.650	1.813 MICRO-IN.		STRAIN S5B
17	-17.838	-6.982	12.955	5.768	9.056 MICRO-IN.		STRAIN S6A
18	-4.034	1.917	4.885	1.646	2.527 MICRO-IN.		STRAIN S6B
19	-10.212	-2.003	15.949	4.621	5.037 MICRO-IN.		STRAIN S7A
20	-5.256	0.003	3.132	1.405	1.405 MICRO-IN.		STRAIN S7B
21	-47.663	80.971	151.944	34.624	88.063 Lbs.		WINCH CABLE LOAD
22	-0.989	-0.050	1.014	0.034	0.060 g.		TOP RIGHT ACC. A1
23	-1.240	-0.052	0.907	0.042	0.067 g.		TOP LEFT ACC. A2
24	-0.887	-0.052	0.410	0.025	0.058 g.		MID. RIGHT ACC. A3
25	-4.771	-0.520	4.769	2.149	2.211 g.		MID. LEFT ACC. A4
26	-1.466	-0.033	1.571	0.082	0.088 g.		BOTTOM RIGHT ACC. A5
27	-1.060	-0.050	0.771	0.040	0.065 g.		BOTTOM LEFT ACC. A6
28	-0.463	-0.038	0.459	0.019	0.043 g.		HORSE ACC. A7X
29	-0.514	-0.034	0.514	0.018	0.039 g.		HORSE ACC. A7Y
30	-1.223	-0.045	1.502	0.048	0.066 g.		HORSE ACC. A7Z
31	-0.095	41.959	69.792	26.061	49.394 Degrees		HORSE TILT-METER T1
32	-28.214	-17.152	0.080	6.708	18.417 Degrees		GATE TILT-METER T2
33	294.935	295.043	295.238	0.062	295.043 Ft. WATER		U/S POOL
34	294.780	294.917	295.069	0.057	294.917 Ft. WATER		D/S POOL
40	-0.500	-0.101	-0.002	0.030	0.105 Volts		P3X
41	-0.283	0.050	0.430	0.118	0.128 Volts		P3Y
42	-0.386	-0.098	0.005	0.098	0.139 Volts		P4X
43	-0.347	0.202	0.669	0.151	0.252 Volts		P4Y
44	-0.386	-0.201	0.037	0.084	0.218 Volts		P5X
45	-0.313	0.042	0.515	0.116	0.123 Volts		P5Y
46	-0.383	-0.214	-0.046	0.056	0.221 Volts		P6X
47	-0.317	0.140	0.532	0.131	0.192 Volts		P6Y
48	-67.064	-43.110	-25.419	10.567	44.386 Degrees		Winch cable angle

Information File Name: **wicketds8b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/24/00 11:15:30 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #8b Series 2a Condition A 7/24/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 295 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 1,2,3,12 down during test.

CHAN NUM	STATISTICS				ROOT MEAN SQUARE	ENGINEERING UNITS	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION			
1	-57.040	-14.356	0.393	5.856	15.504	Lbs.	LOAD PIN 3X
2	-46.027	3.227	124.472	15.704	16.032	Lbs.	LOAD PIN 3Y
3	-22.204	18.737	63.439	13.948	23.358	Lbs.	LOAD PIN 4X
4	-52.288	27.725	150.180	22.758	35.869	Lbs.	LOAD PIN 4Y
5	-6.598	35.398	65.104	14.839	38.383	Lbs.	LOAD PIN 5X
6	-66.602	10.246	188.177	25.661	27.631	Lbs.	LOAD PIN 5Y
7	-69.407	-39.030	-6.771	9.914	40.269	Lbs.	LOAD PIN 6X
8	-50.469	26.372	177.258	22.894	34.923	Lbs.	LOAD PIN 6Y
9	-193.921	22.960	81.933	6.924	23.981	Lbs.	LOAD PIN 1
10	-138.533	-17.060	34.999	14.382	22.313	LBS.	STRAIN GAGE S1
11	-142.775	-22.934	22.967	11.669	25.732	LBS.	STRAIN GAGE S2
12	-5.986	-1.587	4.501	1.131	1.949	MICRO-IN.	STRAIN S3
13	-19.198	-7.607	15.293	6.284	9.866	MICRO-IN.	STRAIN S4A
14	-3.531	2.627	8.844	1.839	3.207	MICRO-IN.	STRAIN S4B
15	-19.260	-0.196	22.737	6.534	6.537	MICRO-IN.	STRAIN S5A
16	-4.962	0.761	6.317	1.653	1.820	MICRO-IN.	STRAIN S5B
17	-16.275	-6.873	13.415	5.741	8.955	MICRO-IN.	STRAIN S6A
18	-4.034	1.904	4.701	1.642	2.514	MICRO-IN.	STRAIN S6B
19	-11.841	-1.939	15.858	4.643	5.031	MICRO-IN.	STRAIN S7A
20	-5.165	0.031	3.861	1.414	1.415	MICRO-IN.	STRAIN S7B
21	-4.654	80.237	150.841	35.729	87.832	Lbs.	WINCH CABLE LOAD
22	-1.085	-0.050	0.699	0.030	0.058	g.	TOP RIGHT ACC. A1
23	-0.948	-0.052	1.838	0.043	0.068	g.	TOP LEFT ACC. A2
24	-0.559	-0.052	0.293	0.021	0.056	g.	MID. RIGHT ACC. A3
25	-4.771	-0.460	4.769	2.316	2.361	g.	MID. LEFT ACC. A4
26	-1.290	-0.025	1.276	0.091	0.094	g.	BOTTOM RIGHT ACC. A5
27	-1.495	-0.051	1.223	0.039	0.064	g.	BOTTOM LEFT ACC. A6
28	-0.506	-0.039	0.514	0.019	0.044	g.	HORSE ACC. A7X
29	-0.625	-0.035	0.783	0.018	0.039	g.	HORSE ACC. A7Y
30	-1.052	-0.046	1.218	0.040	0.060	g.	HORSE ACC. A7Z
31	-0.095	41.260	68.517	25.640	48.578	Degrees	HORSE TILT-METER T1
32	-28.361	-17.068	0.080	6.849	18.391	Degrees	GATE TILT-METER T2
33	295.086	295.215	295.314	0.038	295.215	Ft. WATER	U/S POOL
34	294.906	295.092	295.250	0.048	295.092	Ft. WATER	D/S POOL
40	-0.356	-0.089	0.002	0.036	0.096	Volts	P3X
41	-0.281	0.019	0.747	0.096	0.098	Volts	P3Y
42	-0.388	-0.115	0.120	0.086	0.144	Volts	P4X
43	-0.320	0.172	0.950	0.141	0.223	Volts	P4Y
44	-0.361	-0.196	0.039	0.082	0.213	Volts	P5X
45	-0.310	0.047	0.825	0.118	0.127	Volts	P5Y
46	-0.398	-0.225	-0.039	0.057	0.232	Volts	P6X
47	-0.300	0.157	1.050	0.136	0.208	Volts	P6Y
48	-65.664	-42.806	-24.867	10.527	44.081	Degrees	Winch cable angle

Information File Name: **wicketds8c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/24/00 11:20:26 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #8c Series 2a Condition A 7/24/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 295 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 1,2,3,12 down during test.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN	ENGINEERING UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-55.466	-17.071	0.787	5.452	17.921	Lbs.	LOAD PIN 3X
2	-47.627	6.355	75.644	19.039	20.071	Lbs.	LOAD PIN 3Y
3	-6.740	12.775	64.232	19.178	23.044	Lbs.	LOAD PIN 4X
4	-55.433	37.232	106.541	25.452	45.101	Lbs.	LOAD PIN 4Y
5	-7.918	34.909	61.585	14.446	37.780	Lbs.	LOAD PIN 5X
6	-63.959	10.085	127.918	25.410	27.338	Lbs.	LOAD PIN 5Y
7	-65.175	-38.717	-7.618	9.854	39.951	Lbs.	LOAD PIN 6X
8	-50.880	26.296	84.526	22.744	34.768	Lbs.	LOAD PIN 6Y
9	-114.230	22.126	62.667	7.156	23.254	Lbs.	LOAD PIN 1
10	-134.633	-17.215	33.049	14.720	22.650	LBS.	STRAIN GAGE S1
11	-79.635	-22.636	24.940	11.948	25.596	LBS.	STRAIN GAGE S2
12	-6.624	-1.569	4.410	1.095	1.913	MICRO-IN.	STRAIN S3
13	-19.566	-7.668	14.557	6.217	9.872	MICRO-IN.	STRAIN S4A
14	-3.438	2.670	7.076	1.773	3.205	MICRO-IN.	STRAIN S4B
15	-11.453	-0.024	22.647	6.480	6.480	MICRO-IN.	STRAIN S5A
16	-4.780	0.813	3.952	1.618	1.811	MICRO-IN.	STRAIN S5B
17	-18.665	-6.899	12.495	5.734	8.971	MICRO-IN.	STRAIN S6A
18	-3.942	1.964	4.793	1.624	2.548	MICRO-IN.	STRAIN S6B
19	-9.487	-1.976	15.858	4.634	5.037	MICRO-IN.	STRAIN S7A
20	-5.165	0.039	2.220	1.397	1.398	MICRO-IN.	STRAIN S7B
21	3.066	85.175	164.075	39.099	93.720	Lbs.	WINCH CABLE LOAD
22	-1.171	-0.054	1.089	0.033	0.063	g.	TOP RIGHT ACC. A1
23	-1.453	-0.057	1.213	0.042	0.070	g.	TOP LEFT ACC. A2
24	-4.794	-0.617	4.792	1.956	2.051	g.	MID. RIGHT ACC. A3
25	-4.771	-0.424	4.769	2.381	2.418	g.	MID. LEFT ACC. A4
26	-0.990	-0.024	1.470	0.090	0.093	g.	BOTTOM RIGHT ACC. A5
27	-1.053	-0.054	0.725	0.037	0.066	g.	BOTTOM LEFT ACC. A6
28	-0.460	-0.036	0.338	0.018	0.040	g.	HORSE ACC. A7X
29	-0.641	-0.033	0.497	0.018	0.037	g.	HORSE ACC. A7Y
30	-1.541	-0.043	0.798	0.042	0.060	g.	HORSE ACC. A7Z
31	-0.095	41.474	69.595	25.742	48.813	Degrees	HORSE TILT-METER T1
32	-28.115	-17.045	0.031	6.812	18.356	Degrees	GATE TILT-METER T2
33	295.117	295.221	295.420	0.030	295.221	Ft. WATER	U/S POOL
34	294.943	295.071	295.142	0.025	295.071	Ft. WATER	D/S POOL
40	-0.347	-0.106	0.002	0.034	0.111	Volts	P3X
41	-0.291	0.038	0.464	0.116	0.122	Volts	P3Y
42	-0.398	-0.079	0.056	0.118	0.142	Volts	P4X
43	-0.344	0.231	0.669	0.158	0.280	Volts	P4Y
44	-0.334	-0.194	0.044	0.080	0.210	Volts	P5X
45	-0.295	0.046	0.569	0.117	0.126	Volts	P5Y
46	-0.378	-0.223	-0.046	0.057	0.230	Volts	P6X
47	-0.303	0.157	0.547	0.135	0.207	Volts	P6Y
48	-66.810	-42.915	-25.376	10.543	44.191	Degrees	Winch cable angle

Information File Name: **wicketds9a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/24/00 11:30:22 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #9a Series 2a Condition B 7/24/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 down during test.

CHAN NUM	STATISTICS					ENGINEERING UNITS	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION	ROOT MEAN SQUARE		
1	-79.462	-44.660	3.147	18.554	48.361	Lbs.	LOAD PIN 3X
2	-103.660	0.202	148.486	39.542	39.542	Lbs.	LOAD PIN 3Y
3	5.154	24.682	40.442	7.226	25.718	Lbs.	LOAD PIN 4X
4	-72.731	-14.288	29.092	16.187	21.591	Lbs.	LOAD PIN 4Y
5	-8.798	35.253	58.946	16.861	39.078	Lbs.	LOAD PIN 5X
6	-84.574	-18.289	104.131	25.731	31.568	Lbs.	LOAD PIN 5Y
7	-92.260	-57.865	4.655	22.808	62.198	Lbs.	LOAD PIN 6X
8	-74.268	-4.445	60.727	15.344	15.975	Lbs.	LOAD PIN 6Y
9	-170.276	-1.189	67.046	40.190	40.208	Lbs.	LOAD PIN 1
10	-388.106	-13.848	52.547	26.459	29.864	LBS.	STRAIN GAGE S1
11	-22.415	9.343	36.779	8.652	12.734	LBS.	STRAIN GAGE S2
12	-1.335	1.235	5.504	1.006	1.593	MICRO-IN.	STRAIN S3
13	-26.372	-7.048	10.510	7.691	10.431	MICRO-IN.	STRAIN S4A
14	-3.066	2.116	15.171	2.039	2.939	MICRO-IN.	STRAIN S4B
15	-19.799	-1.280	23.634	8.561	8.656	MICRO-IN.	STRAIN S5A
16	-5.507	0.887	9.500	2.062	2.245	MICRO-IN.	STRAIN S5B
17	-15.080	-5.164	14.058	6.353	8.187	MICRO-IN.	STRAIN S6A
18	-3.942	1.518	4.701	1.814	2.365	MICRO-IN.	STRAIN S6B
19	-14.376	-0.634	16.673	5.200	5.238	MICRO-IN.	STRAIN S7A
20	-5.803	-0.011	3.861	1.744	1.744	MICRO-IN.	STRAIN S7B
21	-2.448	100.675	251.197	52.809	113.685	Lbs.	WINCH CABLE LOAD
22	-0.788	-0.053	0.457	0.025	0.059	g.	TOP RIGHT ACC. A1
23	-1.073	-0.052	0.823	0.037	0.064	g.	TOP LEFT ACC. A2
24	-0.824	-0.090	4.792	0.165	0.188	g.	MID. RIGHT ACC. A3
25	-4.771	-0.444	4.769	2.405	2.446	g.	MID. LEFT ACC. A4
26	-1.238	-0.023	1.664	0.090	0.093	g.	BOTTOM RIGHT ACC. A5
27	-1.394	-0.054	0.600	0.030	0.062	g.	BOTTOM LEFT ACC. A6
28	-0.302	-0.036	0.163	0.010	0.037	g.	HORSE ACC. A7X
29	-0.687	-0.031	0.545	0.014	0.034	g.	HORSE ACC. A7Y
30	-0.972	-0.043	1.429	0.039	0.058	g.	HORSE ACC. A7Z
31	-0.193	40.375	67.831	24.755	47.360	Degrees	HORSE TILT-METER T1
32	-34.364	-21.613	0.080	8.765	23.322	Degrees	GATE TILT-METER T2
33	297.968	298.126	298.271	0.050	298.126	Ft. WATER	U/S POOL
34	294.508	294.779	295.051	0.118	294.779	Ft. WATER	D/S POOL
40	-0.532	-0.277	0.020	0.115	0.300	Volts	P3X
41	-0.632	0.001	0.923	0.241	0.241	Volts	P3Y
42	-0.251	-0.152	-0.034	0.044	0.158	Volts	P4X
43	-0.452	-0.089	0.181	0.101	0.134	Volts	P4Y
44	-0.330	-0.196	0.049	0.094	0.217	Volts	P5X
45	-0.393	-0.085	0.461	0.119	0.146	Volts	P5Y
46	-0.537	-0.334	0.027	0.132	0.359	Volts	P6X
47	-0.444	-0.027	0.388	0.091	0.095	Volts	P6Y
48	-64.390	-34.569	-15.697	12.737	36.841	Degrees	Winch cable angle



Information File Name: **wicketds9b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/24/00 11:32:19 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #9b Series 2a Condition B 7/24/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 down during test.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN	ENGINEERING UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-64.907	-43.426	2.754	15.714	46.182	Lbs.	LOAD PIN 3X
2	-102.859	-5.640	168.497	33.778	34.246	Lbs.	LOAD PIN 3Y
3	-7.137	24.070	40.046	6.099	24.831	Lbs.	LOAD PIN 4X
4	-62.903	-8.709	50.322	15.433	17.721	Lbs.	LOAD PIN 4Y
5	-6.159	33.180	53.667	15.050	36.434	Lbs.	LOAD PIN 5X
6	-78.231	-16.963	120.518	22.185	27.927	Lbs.	LOAD PIN 5Y
7	-88.451	-57.576	6.771	21.182	61.349	Lbs.	LOAD PIN 6X
8	-75.499	-4.806	56.214	15.131	15.876	Lbs.	LOAD PIN 6Y
9	-215.814	-4.614	75.803	44.506	44.744	Lbs.	LOAD PIN 1
10	-140.482	-11.020	58.396	23.983	26.394	LBS.	STRAIN GAGE S1
11	-26.361	7.638	36.779	7.493	10.700	LBS.	STRAIN GAGE S2
12	-1.973	0.853	5.596	1.075	1.373	MICRO-IN.	STRAIN S3
13	-22.969	-7.589	15.017	8.167	11.148	MICRO-IN.	STRAIN S4A
14	-3.903	2.259	10.705	2.118	3.097	MICRO-IN.	STRAIN S4B
15	-18.273	-1.349	27.044	8.892	8.993	MICRO-IN.	STRAIN S5A
16	-6.235	0.888	4.680	2.091	2.271	MICRO-IN.	STRAIN S5B
17	-15.264	-5.238	14.058	6.340	8.224	MICRO-IN.	STRAIN S6A
18	-4.126	1.614	4.977	1.833	2.442	MICRO-IN.	STRAIN S6B
19	-15.552	-0.581	17.759	5.228	5.260	MICRO-IN.	STRAIN S7A
20	-6.259	0.016	4.135	1.740	1.740	MICRO-IN.	STRAIN S7B
21	1.963	106.330	192.748	62.474	123.326	Lbs.	WINCH CABLE LOAD
22	-0.420	-0.054	0.620	0.023	0.059	g.	TOP RIGHT ACC. A1
23	-1.223	-0.053	0.873	0.043	0.068	g.	TOP LEFT ACC. A2
24	-1.145	-0.053	1.868	0.095	0.109	g.	MID. RIGHT ACC. A3
25	-4.771	-0.440	4.769	2.437	2.476	g.	MID. LEFT ACC. A4
26	-0.754	-0.021	1.094	0.091	0.094	g.	BOTTOM RIGHT ACC. A5
27	-0.971	-0.055	0.740	0.030	0.063	g.	BOTTOM LEFT ACC. A6
28	-0.345	-0.037	0.163	0.011	0.038	g.	HORSE ACC. A7X
29	-0.479	-0.032	0.796	0.016	0.035	g.	HORSE ACC. A7Y
30	-1.075	-0.044	1.686	0.048	0.065	g.	HORSE ACC. A7Z
31	-0.095	40.574	68.370	24.614	47.456	Degrees	HORSE TILT-METER T1
32	-33.626	-22.107	0.031	8.634	23.733	Degrees	GATE TILT-METER T2
33	297.998	298.128	298.287	0.055	298.128	Ft. WATER	U/S POOL
34	294.545	294.846	295.250	0.177	294.846	Ft. WATER	D/S POOL
40	-0.417	-0.269	0.007	0.098	0.286	Volts	P3X
41	-0.627	-0.035	0.916	0.206	0.209	Volts	P3Y
42	-0.249	-0.148	0.044	0.038	0.153	Volts	P4X
43	-0.393	-0.054	0.308	0.096	0.110	Volts	P4Y
44	-0.298	-0.184	0.034	0.084	0.202	Volts	P5X
45	-0.361	-0.079	0.525	0.103	0.129	Volts	P5Y
46	-0.525	-0.332	0.037	0.122	0.354	Volts	P6X
47	-0.449	-0.029	0.405	0.090	0.094	Volts	P6Y
48	-63.668	-33.907	-16.673	12.454	36.122	Degrees	Winch cable angle

Information File Name: **wicketds9c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/24/00 11:34:04 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #9c Series 2a Condition B 7/24/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 down during test.

CHAN NUM	STATISTICS					ENGINEERING UNITS	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION	ROOT MEAN SQUARE		
1	-65.694	-42.998	5.114	15.981	45.872	Lbs.	LOAD PIN 3X
2	-115.667	-0.913	102.459	37.367	37.378	Lbs.	LOAD PIN 3Y
3	-2.379	23.753	40.839	6.856	24.723	Lbs.	LOAD PIN 4X
4	-53.467	-7.017	60.544	15.942	17.418	Lbs.	LOAD PIN 4Y
5	-6.598	33.412	57.186	15.223	36.717	Lbs.	LOAD PIN 5X
6	-88.274	-14.755	79.288	23.432	27.690	Lbs.	LOAD PIN 5Y
7	-84.219	-58.146	9.734	21.053	61.840	Lbs.	LOAD PIN 6X
8	-76.320	-2.043	49.238	16.165	16.294	Lbs.	LOAD PIN 6Y
9	-100.218	23.628	63.543	10.495	25.854	Lbs.	LOAD PIN 1
10	-156.081	-13.266	64.246	25.040	28.337	LBS.	STRAIN GAGE S1
11	-42.146	5.227	34.806	8.503	9.981	LBS.	STRAIN GAGE S2
12	-2.156	0.954	4.410	0.865	1.288	MICRO-IN.	STRAIN S3
13	-19.014	-5.604	15.477	6.552	8.621	MICRO-IN.	STRAIN S4A
14	-3.810	2.038	13.682	1.988	2.847	MICRO-IN.	STRAIN S4B
15	-15.491	0.210	25.608	7.488	7.491	MICRO-IN.	STRAIN S5A
16	-6.053	0.802	7.227	1.974	2.131	MICRO-IN.	STRAIN S5B
17	-21.239	-5.671	14.242	6.660	8.747	MICRO-IN.	STRAIN S6A
18	-4.309	1.565	5.253	1.802	2.387	MICRO-IN.	STRAIN S6B
19	-13.470	-1.037	17.850	5.438	5.536	MICRO-IN.	STRAIN S7A
20	-6.350	-0.020	3.405	1.659	1.659	MICRO-IN.	STRAIN S7B
21	7.477	139.081	228.038	34.416	143.276	Lbs.	WINCH CABLE LOAD
22	-0.835	-0.054	0.888	0.028	0.061	g.	TOP RIGHT ACC. A1
23	-0.955	-0.052	1.438	0.044	0.068	g.	TOP LEFT ACC. A2
24	-2.973	-0.223	4.792	0.549	0.593	g.	MID. RIGHT ACC. A3
25	-4.771	-0.417	4.769	2.491	2.526	g.	MID. LEFT ACC. A4
26	-0.933	-0.021	1.586	0.095	0.097	g.	BOTTOM RIGHT ACC. A5
27	-1.178	-0.054	0.968	0.034	0.064	g.	BOTTOM LEFT ACC. A6
28	-0.282	-0.037	0.239	0.011	0.039	g.	HORSE ACC. A7X
29	-0.764	-0.032	0.437	0.016	0.035	g.	HORSE ACC. A7Y
30	-1.159	-0.044	0.673	0.040	0.060	g.	HORSE ACC. A7Z
31	-0.144	40.854	67.292	24.590	47.683	Degrees	HORSE TILT-METER T1
32	-33.036	-22.353	0.080	8.552	23.933	Degrees	GATE TILT-METER T2
33	298.059	298.244	298.393	0.075	298.244	Ft. WATER	U/S POOL
34	294.508	294.771	295.069	0.141	294.771	Ft. WATER	D/S POOL
40	-0.398	-0.266	0.032	0.099	0.284	Volts	P3X
41	-0.706	-0.006	0.579	0.228	0.228	Volts	P3Y
42	-0.251	-0.146	0.029	0.042	0.152	Volts	P4X
43	-0.334	-0.044	0.376	0.099	0.108	Volts	P4Y
44	-0.310	-0.185	0.037	0.085	0.204	Volts	P5X
45	-0.410	-0.068	0.300	0.108	0.128	Volts	P5Y
46	-0.496	-0.335	0.056	0.121	0.357	Volts	P6X
47	-0.454	-0.012	0.322	0.096	0.097	Volts	P6Y
48	-62.734	-32.733	-16.631	12.509	35.041	Degrees	Winch cable angle

Information File Name: **wicketds10a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/25/00 8:57:58 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #10a Series 2a Condition C 7/25/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 down during test.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN	ENGINEERING UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-94.017	-54.801	15.342	26.996	61.089	Lbs.	LOAD PIN 3X
2	-116.867	5.502	103.660	47.730	48.046	Lbs.	LOAD PIN 3Y
3	-47.976	15.813	57.888	16.033	22.519	Lbs.	LOAD PIN 4X
4	-157.650	-46.626	54.253	33.657	57.505	Lbs.	LOAD PIN 4Y
5	-7.478	33.417	67.304	16.732	37.372	Lbs.	LOAD PIN 5X
6	-115.232	-38.605	52.859	18.168	42.666	Lbs.	LOAD PIN 5Y
7	-105.380	-66.256	18.621	32.057	73.604	Lbs.	LOAD PIN 6X
8	-110.786	-35.428	30.774	25.264	43.514	Lbs.	LOAD PIN 6Y
9	-528.522	-39.704	60.865	98.315	106.029	Lbs.	LOAD PIN 1
10	-78.295	-4.134	71.673	27.606	27.914	LBS.	STRAIN GAGE S1
11	-31.969	40.803	137.850	27.775	49.359	LBS.	STRAIN GAGE S2
12	-2.144	2.546	7.053	1.742	3.085	MICRO-IN.	STRAIN S3
13	-29.591	-7.527	11.385	10.008	12.522	MICRO-IN.	STRAIN S4A
14	-2.776	1.916	5.380	2.074	2.823	MICRO-IN.	STRAIN S4B
15	-25.555	-2.293	21.329	10.245	10.498	MICRO-IN.	STRAIN S5A
16	-5.496	0.283	4.777	1.944	1.964	MICRO-IN.	STRAIN S5B
17	-17.378	-3.432	13.139	6.076	6.978	MICRO-IN.	STRAIN S6A
18	-3.799	1.198	4.249	1.714	2.091	MICRO-IN.	STRAIN S6B
19	-13.718	1.214	17.085	5.266	5.404	MICRO-IN.	STRAIN S7A
20	-5.716	-0.161	3.641	1.736	1.743	MICRO-IN.	STRAIN S7B
21	-16.374	117.703	243.845	90.549	148.503	Lbs.	WINCH CABLE LOAD
22	-0.674	-0.056	0.564	0.026	0.061	g.	TOP RIGHT ACC. A1
23	-1.073	-0.055	1.268	0.048	0.073	g.	TOP LEFT ACC. A2
24	-4.794	-1.050	4.792	1.994	2.253	g.	MID. RIGHT ACC. A3
25	-4.771	-0.433	4.769	2.490	2.527	g.	MID. LEFT ACC. A4
26	-1.539	-0.023	1.801	0.097	0.100	g.	BOTTOM RIGHT ACC. A5
27	-0.495	-0.057	0.451	0.026	0.062	g.	BOTTOM LEFT ACC. A6
28	-0.633	-0.036	0.252	0.013	0.039	g.	HORSE ACC. A7X
29	-0.294	-0.030	0.288	0.010	0.032	g.	HORSE ACC. A7Y
30	-1.135	-0.043	1.425	0.160	0.166	g.	HORSE ACC. A7Z
31	-0.144	38.844	67.439	24.610	45.984	Degrees	HORSE TILT-METER T1
32	-38.990	-27.009	0.031	12.210	29.640	Degrees	GATE TILT-METER T2
33	299.667	300.131	300.573	0.258	300.131	Ft. WATER	U/S POOL
34	294.110	294.854	295.612	0.419	294.854	Ft. WATER	D/S POOL
40	-0.574	-0.340	0.098	0.168	0.379	Volts	P3X
41	-0.713	0.033	0.625	0.291	0.293	Volts	P3Y
42	-0.352	-0.098	0.303	0.099	0.139	Volts	P4X
43	-1.006	-0.290	0.337	0.209	0.357	Volts	P4Y
44	-0.378	-0.186	0.042	0.093	0.208	Volts	P5X
45	-0.522	-0.179	0.247	0.084	0.197	Volts	P5Y
46	-0.605	-0.382	0.107	0.185	0.425	Volts	P6X
47	-0.664	-0.211	0.183	0.150	0.259	Volts	P6Y
48	-64.348	-24.761	-3.216	19.372	31.438	Degrees	Winch cable angle

Information File Name: **wicketds10b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/25/00 8:59:38 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #10b Series 2a Condition C 7/25/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 down during test.

CHAN NUM	STATISTICS					ENGINEERING UNITS	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION	ROOT MEAN SQUARE		
1	-94.804	-51.120	14.162	24.820	56.827 Lbs.		LOAD PIN 3X
2	-146.484	3.243	127.674	56.126	56.219 Lbs.		LOAD PIN 3Y
3	-39.649	16.182	42.028	13.589	21.131 Lbs.		LOAD PIN 4X
4	-102.610	-43.921	46.784	31.172	53.858 Lbs.		LOAD PIN 4Y
5	-7.478	32.869	61.145	16.328	36.701 Lbs.		LOAD PIN 5X
6	-112.060	-37.865	59.202	22.468	44.029 Lbs.		LOAD PIN 5Y
7	-101.994	-66.539	17.352	30.901	73.365 Lbs.		LOAD PIN 6X
8	-83.705	-31.565	36.519	20.343	37.553 Lbs.		LOAD PIN 6Y
9	-309.582	-34.096	56.487	89.908	96.156 Lbs.		LOAD PIN 1
10	-93.877	-5.739	91.150	34.154	34.633 LBS.		STRAIN GAGE S1
11	-31.969	37.360	84.534	26.230	45.649 LBS.		STRAIN GAGE S2
12	-2.053	2.495	6.779	1.789	3.070 MICRO-IN.		STRAIN S3
13	-25.129	-7.331	12.022	9.906	12.324 MICRO-IN.		STRAIN S4A
14	-2.959	1.923	5.471	2.199	2.921 MICRO-IN.		STRAIN S4B
15	-24.200	-2.563	20.697	10.176	10.494 MICRO-IN.		STRAIN S5A
16	-5.041	0.418	4.868	2.100	2.141 MICRO-IN.		STRAIN S5B
17	-15.264	-3.775	12.679	6.475	7.495 MICRO-IN.		STRAIN S6A
18	-3.618	1.319	4.068	1.894	2.308 MICRO-IN.		STRAIN S6B
19	-14.538	0.921	16.082	5.705	5.779 MICRO-IN.		STRAIN S7A
20	-5.443	-0.057	3.641	1.919	1.920 MICRO-IN.		STRAIN S7B
21	-7.553	130.830	257.077	94.677	161.494 Lbs.		WINCH CABLE LOAD
22	-0.551	-0.056	0.461	0.025	0.061 g.		TOP RIGHT ACC. A1
23	-2.054	-0.054	1.474	0.052	0.076 g.		TOP LEFT ACC. A2
24	-4.794	-1.962	4.792	2.618	3.271 g.		MID. RIGHT ACC. A3
25	-4.771	-0.431	4.769	2.496	2.533 g.		MID. LEFT ACC. A4
26	-1.388	-0.024	0.962	0.091	0.094 g.		BOTTOM RIGHT ACC. A5
27	-0.693	-0.057	0.603	0.026	0.063 g.		BOTTOM LEFT ACC. A6
28	-0.178	-0.036	0.109	0.011	0.038 g.		HORSE ACC. A7X
29	-0.560	-0.031	0.725	0.015	0.035 g.		HORSE ACC. A7Y
30	-1.156	-0.040	1.263	0.143	0.149 g.		HORSE ACC. A7Z
31	-0.144	39.473	67.390	24.462	46.438 Degrees		HORSE TILT-METER T1
32	-35.693	-25.876	0.031	10.801	28.040 Degrees		GATE TILT-METER T2
33	299.621	300.148	300.527	0.189	300.148 Ft. WATER		U/S POOL
34	294.309	294.772	295.214	0.238	294.772 Ft. WATER		D/S POOL
40	-0.586	-0.317	0.090	0.154	0.353 Volts		P3X
41	-0.891	0.020	0.781	0.343	0.343 Volts		P3Y
42	-0.259	-0.100	0.239	0.084	0.130 Volts		P4X
43	-0.635	-0.272	0.291	0.194	0.334 Volts		P4Y
44	-0.344	-0.183	0.042	0.091	0.204 Volts		P5X
45	-0.515	-0.175	0.251	0.104	0.204 Volts		P5Y
46	-0.591	-0.384	0.098	0.178	0.423 Volts		P6X
47	-0.500	-0.187	0.222	0.121	0.223 Volts		P6Y
48	-63.032	-26.768	-11.027	16.678	31.538 Degrees		Winch cable angle

Information File Name: **wicketds10c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/25/00 9:03:15 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #10c Series 2a Condition C 7/25/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees, gates 7 & 8 down during test.

STATISTICS						
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
1	-84.576	-49.166	15.342	23.368	54.437 Lbs.	LOAD PIN 3X
2	-139.680	2.973	132.076	54.491	54.572 Lbs.	LOAD PIN 3Y
3	-51.544	19.047	45.993	12.682	22.883 Lbs.	LOAD PIN 4X
4	-169.444	-43.468	56.219	28.416	51.932 Lbs.	LOAD PIN 4Y
5	-10.997	33.205	60.705	16.668	37.154 Lbs.	LOAD PIN 5X
6	-116.289	-38.669	98.317	21.117	44.059 Lbs.	LOAD PIN 5Y
7	-103.264	-64.161	19.045	29.142	70.469 Lbs.	LOAD PIN 6X
8	-118.583	-30.123	25.850	22.102	37.361 Lbs.	LOAD PIN 6Y
9	-523.267	-25.384	59.114	78.078	82.100 Lbs.	LOAD PIN 1
10	-105.562	-4.386	85.307	33.285	33.573 LBS.	STRAIN GAGE S1
11	-31.969	36.474	131.926	24.249	43.799 LBS.	STRAIN GAGE S2
12	-2.327	2.682	8.327	1.795	3.227 MICRO-IN.	STRAIN S3
13	-33.233	-6.862	12.296	9.999	12.127 MICRO-IN.	STRAIN S4A
14	-3.325	1.812	6.663	2.298	2.927 MICRO-IN.	STRAIN S4B
15	-29.620	-2.523	19.793	9.799	10.118 MICRO-IN.	STRAIN S5A
16	-5.405	0.487	5.050	2.136	2.191 MICRO-IN.	STRAIN S5B
17	-19.400	-3.818	13.966	6.749	7.754 MICRO-IN.	STRAIN S6A
18	-3.799	1.320	4.882	1.936	2.343 MICRO-IN.	STRAIN S6B
19	-12.260	0.785	16.173	5.917	5.969 MICRO-IN.	STRAIN S7A
20	-5.443	-0.029	3.459	1.924	1.924 MICRO-IN.	STRAIN S7B
21	10.089	139.081	249.359	85.584	163.304 Lbs.	WINCH CABLE LOAD
22	-0.518	-0.056	0.284	0.024	0.061 g.	TOP RIGHT ACC. A1
23	-1.283	-0.055	1.778	0.050	0.074 g.	TOP LEFT ACC. A2
24	-4.794	-1.511	4.792	2.890	3.261 g.	MID. RIGHT ACC. A3
25	-4.771	-0.440	4.769	2.512	2.550 g.	MID. LEFT ACC. A4
26	-1.383	-0.024	0.861	0.092	0.095 g.	BOTTOM RIGHT ACC. A5
27	-0.757	-0.057	0.632	0.027	0.063 g.	BOTTOM LEFT ACC. A6
28	-0.290	-0.038	0.239	0.012	0.040 g.	HORSE ACC. A7X
29	-0.879	-0.031	0.551	0.015	0.035 g.	HORSE ACC. A7Y
30	-1.540	-0.044	1.081	0.140	0.146 g.	HORSE ACC. A7Z
31	-0.144	39.559	67.782	24.511	46.537 Degrees	HORSE TILT-METER T1
32	-35.595	-26.207	0.080	11.057	28.444 Degrees	GATE TILT-METER T2
33	299.544	299.899	300.358	0.256	299.899 Ft. WATER	U/S POOL
34	294.219	294.745	295.087	0.271	294.745 Ft. WATER	D/S POOL
40	-0.535	-0.305	0.093	0.145	0.338 Volts	P3X
41	-0.852	0.018	0.776	0.332	0.333 Volts	P3Y
42	-0.300	-0.117	0.320	0.078	0.141 Volts	P4X
43	-1.016	-0.269	0.347	0.177	0.322 Volts	P4Y
44	-0.334	-0.185	0.061	0.092	0.207 Volts	P5X
45	-0.515	-0.179	0.420	0.098	0.204 Volts	P5Y
46	-0.588	-0.370	0.110	0.168	0.406 Volts	P6X
47	-0.693	-0.179	0.156	0.132	0.222 Volts	P6Y
48	-62.649	-26.062	-9.244	17.266	31.262 Degrees	Winch cable angle

Information File Name: **wicketds12a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/25/00 10:52:47 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #12a Series 2b Condition A 7/25/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 295 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from up position to 65 degrees, gates 7 & 8 down during test.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING	UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-29.897	-7.001	40.518	9.636	11.911	Lbs.	LOAD PIN 3X
2	-62.436	4.464	150.487	5.090	6.770	Lbs.	LOAD PIN 3Y
3	-56.302	4.591	35.684	6.425	7.896	Lbs.	LOAD PIN 4X
4	-11.794	58.353	139.565	6.742	58.741	Lbs.	LOAD PIN 4Y
5	6.159	35.478	53.227	10.129	36.896	Lbs.	LOAD PIN 5X
6	-107.303	33.641	255.307	8.125	34.608	Lbs.	LOAD PIN 5Y
7	-80.410	-30.561	14.812	6.787	31.305	Lbs.	LOAD PIN 6X
8	-29.953	74.477	144.022	12.673	75.548	Lbs.	LOAD PIN 6Y
9	-339.357	-35.900	13.574	18.400	40.341	Lbs.	LOAD PIN 1
10	-162.044	-0.188	91.150	9.159	9.161	LBS.	STRAIN GAGE S1
11	-93.183	-32.251	35.168	9.736	33.689	LBS.	STRAIN GAGE S2
12	-6.060	-0.549	6.142	0.680	0.874	MICRO-IN.	STRAIN S3
13	-27.588	-8.414	36.790	2.995	8.932	MICRO-IN.	STRAIN S4A
14	-6.807	0.680	6.663	0.720	0.991	MICRO-IN.	STRAIN S4B
15	-35.672	-5.658	8.321	2.212	6.075	MICRO-IN.	STRAIN S5A
16	-0.677	2.386	8.596	0.450	2.428	MICRO-IN.	STRAIN S5B
17	-20.963	-8.408	2.384	0.917	8.458	MICRO-IN.	STRAIN S6A
18	-0.634	3.371	4.972	0.418	3.397	MICRO-IN.	STRAIN S6B
19	-17.363	-4.518	5.602	0.577	4.555	MICRO-IN.	STRAIN S7A
20	-0.719	1.242	5.367	0.247	1.266	MICRO-IN.	STRAIN S7B
21	-8.656	12.162	102.709	20.907	24.188	Lbs.	WINCH CABLE LOAD
22	-3.598	-0.059	3.292	0.082	0.101	g.	TOP RIGHT ACC. A1
23	-1.853	-0.053	1.323	0.049	0.073	g.	TOP LEFT ACC. A2
24	-0.061	-0.054	-0.037	0.002	0.054	g.	MID. RIGHT ACC. A3
25	-0.070	-0.060	-0.044	0.002	0.060	g.	MID. LEFT ACC. A4
26	-1.860	-0.052	1.100	0.069	0.087	g.	BOTTOM RIGHT ACC. A5
27	-2.459	-0.058	4.899	0.085	0.103	g.	BOTTOM LEFT ACC. A6
28	-1.433	-0.038	0.536	0.021	0.044	g.	HORSE ACC. A7X
29	-0.270	-0.039	0.243	0.009	0.040	g.	HORSE ACC. A7Y
30	-0.344	-0.044	0.479	0.029	0.053	g.	HORSE ACC. A7Z
31	64.793	65.112	65.381	0.063	65.112	Degrees	HORSE TILT-METER T1
32	-13.698	40.383	67.543	29.687	50.121	Degrees	GATE TILT-METER T2
33	294.996	295.254	295.499	0.117	295.255	Ft. WATER	U/S POOL
34	294.870	295.006	295.214	0.069	295.006	Ft. WATER	D/S POOL
40	-0.183	-0.043	0.264	0.060	0.074	Volts	P3X
41	-0.393	0.027	0.813	0.031	0.041	Volts	P3Y
42	-0.220	-0.028	0.361	0.040	0.049	Volts	P4X
43	-0.073	0.362	0.869	0.042	0.365	Volts	P4Y
44	-0.293	-0.197	-0.032	0.056	0.205	Volts	P5X
45	-0.493	0.158	1.094	0.038	0.162	Volts	P5Y
46	-0.454	-0.176	0.085	0.039	0.181	Volts	P6X
47	-0.195	0.443	0.867	0.075	0.449	Volts	P6Y
48	-85.616	-71.671	-46.305	9.048	72.240	Degrees	Winch cable angle

Information File Name: **wicketds12b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/25/00 10:56:10 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #12b Series 2b Condition A 7/25/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 295 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from up position to 65 degrees, gates 7 & 8 down during test.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING	UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-30.290	-3.428	47.599	9.509	10.108	Lbs.	LOAD PIN 3X
2	-64.037	5.852	98.857	7.236	9.306	Lbs.	LOAD PIN 3Y
3	-59.077	1.150	31.719	7.585	7.672	Lbs.	LOAD PIN 4X
4	-3.931	57.306	138.386	10.516	58.263	Lbs.	LOAD PIN 4Y
5	7.918	35.612	57.626	10.032	36.998	Lbs.	LOAD PIN 5X
6	-87.217	38.288	196.634	7.759	39.066	Lbs.	LOAD PIN 5Y
7	-77.448	-33.686	10.157	7.343	34.477	Lbs.	LOAD PIN 6X
8	-35.288	75.240	134.175	11.297	76.084	Lbs.	LOAD PIN 6Y
9	-293.818	-32.174	23.208	20.975	38.407	Lbs.	LOAD PIN 1
10	-160.096	-2.259	79.464	8.740	9.027	LBS.	STRAIN GAGE S1
11	-81.336	-34.743	27.270	8.912	35.868	LBS.	STRAIN GAGE S2
12	-6.880	-0.549	4.321	0.732	0.915	MICRO-IN.	STRAIN S3
13	-25.949	-8.024	45.350	2.752	8.483	MICRO-IN.	STRAIN S4A
14	-10.839	0.638	8.862	0.713	0.957	MICRO-IN.	STRAIN S4B
15	-53.739	-5.084	12.657	1.702	5.361	MICRO-IN.	STRAIN S5A
16	-0.768	2.385	12.232	0.391	2.416	MICRO-IN.	STRAIN S5B
17	-14.437	-8.284	1.925	0.886	8.331	MICRO-IN.	STRAIN S6A
18	-0.091	3.336	6.690	0.478	3.370	MICRO-IN.	STRAIN S6B
19	-15.541	-4.505	7.698	0.551	4.538	MICRO-IN.	STRAIN S7A
20	-0.719	1.184	4.549	0.245	1.209	MICRO-IN.	STRAIN S7B
21	-42.837	16.410	87.273	26.227	30.938	Lbs.	WINCH CABLE LOAD
22	-2.127	-0.055	2.665	0.069	0.088	g.	TOP RIGHT ACC. A1
23	-4.579	-0.053	1.455	0.064	0.083	g.	TOP LEFT ACC. A2
24	-0.068	-0.054	-0.037	0.002	0.054	g.	MID. RIGHT ACC. A3
25	-0.070	-0.060	-0.054	0.002	0.060	g.	MID. LEFT ACC. A4
26	-4.368	-0.058	1.801	0.069	0.090	g.	BOTTOM RIGHT ACC. A5
27	-3.677	-0.056	4.503	0.090	0.106	g.	BOTTOM LEFT ACC. A6
28	-0.587	-0.038	0.471	0.014	0.040	g.	HORSE ACC. A7X
29	-0.725	-0.039	0.363	0.011	0.040	g.	HORSE ACC. A7Y
30	-0.847	-0.044	0.734	0.034	0.056	g.	HORSE ACC. A7Z
31	64.057	65.212	66.557	0.313	65.212	Degrees	HORSE TILT-METER T1
32	-11.483	41.474	67.543	28.707	50.440	Degrees	GATE TILT-METER T2
33	295.169	295.321	295.452	0.060	295.321	Ft. WATER	U/S POOL
34	294.979	295.135	295.268	0.054	295.135	Ft. WATER	D/S POOL
40	-0.273	-0.020	0.308	0.059	0.063	Volts	P3X
41	-0.383	0.036	0.740	0.044	0.057	Volts	P3Y
42	-0.186	-0.007	0.354	0.047	0.047	Volts	P4X
43	-0.039	0.356	0.857	0.065	0.362	Volts	P4Y
44	-0.322	-0.198	-0.042	0.056	0.205	Volts	P5X
45	-0.381	0.179	1.042	0.037	0.183	Volts	P5Y
46	-0.444	-0.194	0.051	0.042	0.199	Volts	P6X
47	-0.205	0.448	0.793	0.067	0.453	Volts	P6Y
48	-81.116	-72.099	-48.937	7.732	72.513	Degrees	Winch cable angle

Information File Name: **wicketds12c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/25/00 10:58:35 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #12c Series 2b Condition A 7/25/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 295 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from up position to 65 degrees, gates 7 & 8 down during test.

CHAN	STATISTICS					ENGINEERING UNITS	TYPE OF GAGE
	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN SQUARE		
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION			
1	-31.077	-4.256	39.338	10.406	11.242 Lbs.		LOAD PIN 3X
2	-67.239	5.786	143.283	7.146	9.195 Lbs.		LOAD PIN 3Y
3	-59.077	2.866	37.667	8.250	8.734 Lbs.		LOAD PIN 4X
4	-13.367	53.610	158.436	12.219	54.985 Lbs.		LOAD PIN 4Y
5	4.839	36.225	69.063	10.165	37.624 Lbs.		LOAD PIN 5X
6	-106.246	36.786	249.493	8.446	37.743 Lbs.		LOAD PIN 5Y
7	-80.834	-32.003	16.928	7.182	32.799 Lbs.		LOAD PIN 6X
8	-30.364	74.449	177.258	13.075	75.589 Lbs.		LOAD PIN 6Y
9	-693.165	-35.152	32.841	22.551	41.763 Lbs.		LOAD PIN 1
10	-162.044	-0.902	95.045	9.034	9.079 LBS.		STRAIN GAGE S1
11	-116.879	-33.425	35.168	9.352	34.709 LBS.		STRAIN GAGE S2
12	-5.969	-0.550	5.505	0.681	0.876 MICRO-IN.		STRAIN S3
13	-47.074	-8.404	38.793	3.283	9.023 MICRO-IN.		STRAIN S4A
14	-7.815	0.766	8.953	0.812	1.117 MICRO-IN.		STRAIN S4B
15	-45.609	-5.382	7.688	1.964	5.729 MICRO-IN.		STRAIN S5A
16	-0.314	2.469	11.141	0.446	2.509 MICRO-IN.		STRAIN S5B
17	-21.515	-8.348	3.855	0.971	8.405 MICRO-IN.		STRAIN S6A
18	-0.815	3.401	10.578	0.544	3.444 MICRO-IN.		STRAIN S6B
19	-15.541	-4.600	4.873	0.666	4.648 MICRO-IN.		STRAIN S7A
20	-1.537	1.213	8.546	0.298	1.249 MICRO-IN.		STRAIN S7B
21	-9.758	11.355	87.273	23.989	26.540 Lbs.		WINCH CABLE LOAD
22	-3.619	-0.056	3.323	0.088	0.104 g.		TOP RIGHT ACC. A1
23	-2.308	-0.057	1.445	0.061	0.084 g.		TOP LEFT ACC. A2
24	-0.068	-0.054	-0.047	0.002	0.054 g.		MID. RIGHT ACC. A3
25	-0.070	-0.060	-0.044	0.002	0.060 g.		MID. LEFT ACC. A4
26	-2.209	-0.067	1.661	0.068	0.096 g.		BOTTOM RIGHT ACC. A5
27	-2.149	-0.058	4.899	0.087	0.104 g.		BOTTOM LEFT ACC. A6
28	-1.316	-0.039	0.516	0.024	0.046 g.		HORSE ACC. A7X
29	-0.490	-0.039	0.323	0.013	0.041 g.		HORSE ACC. A7Y
30	-1.645	-0.045	1.667	0.053	0.070 g.		HORSE ACC. A7Z
31	62.930	65.339	67.488	0.637	65.342 Degrees		HORSE TILT-METER T1
32	-12.418	40.146	67.543	29.028	49.541 Degrees		GATE TILT-METER T2
33	295.169	295.252	295.342	0.028	295.252 Ft. WATER		U/S POOL
34	294.870	294.940	295.015	0.022	294.940 Ft. WATER		D/S POOL
40	-0.188	-0.025	0.261	0.065	0.070 Volts		P3X
41	-0.415	0.035	0.837	0.044	0.056 Volts		P3Y
42	-0.229	-0.018	0.378	0.051	0.054 Volts		P4X
43	-0.081	0.333	0.994	0.076	0.341 Volts		P4Y
44	-0.374	-0.201	-0.017	0.056	0.209 Volts		P5X
45	-0.500	0.173	1.128	0.040	0.177 Volts		P5Y
46	-0.454	-0.185	0.095	0.041	0.189 Volts		P6X
47	-0.190	0.443	1.082	0.078	0.450 Volts		P6Y
48	-84.428	-72.535	-49.107	7.866	72.960 Degrees		Winch cable angle



Information File Name: **wicketds11a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/25/00 10:24:56 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #11a Series 2b Condition B 7/25/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from up position to 65 degrees, gates 7 & 8 down during test.

STATISTICS						
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
1	-70.021	-17.791	36.978	26.722	32.103 Lbs.	LOAD PIN 3X
2	-132.877	-0.243	103.660	48.509	48.510 Lbs.	LOAD PIN 3Y
3	-106.657	15.404	42.028	14.547	21.187 Lbs.	LOAD PIN 4X
4	-199.716	-22.143	34.596	26.755	34.729 Lbs.	LOAD PIN 4Y
5	-0.440	28.320	51.467	11.498	30.566 Lbs.	LOAD PIN 5X
6	-229.935	-71.125	19.029	55.618	90.289 Lbs.	LOAD PIN 5Y
7	-89.298	-37.922	43.168	24.174	44.972 Lbs.	LOAD PIN 6X
8	-143.612	41.494	151.408	55.190	69.049 Lbs.	LOAD PIN 6Y
9	-691.413	-232.166	26.711	108.004	256.059 Lbs.	LOAD PIN 1
10	-51.028	20.461	159.317	38.605	43.692 LBS.	STRAIN GAGE S1
11	-43.817	0.703	139.824	18.862	18.875 LBS.	STRAIN GAGE S2
12	0.041	4.490	10.786	2.167	4.985 MICRO-IN.	STRAIN S3
13	-19.757	-4.791	35.242	4.209	6.377 MICRO-IN.	STRAIN S4A
14	-8.548	0.999	6.296	0.690	1.214 MICRO-IN.	STRAIN S4B
15	-30.794	-11.842	25.846	6.796	13.653 MICRO-IN.	STRAIN S5A
16	0.141	5.374	11.960	1.136	5.492 MICRO-IN.	STRAIN S5B
17	-24.732	-10.270	5.326	1.364	10.360 MICRO-IN.	STRAIN S6A
18	0.451	3.848	7.142	0.466	3.876 MICRO-IN.	STRAIN S6B
19	-16.634	-7.413	7.242	1.401	7.545 MICRO-IN.	STRAIN S7A
20	-0.629	3.900	6.729	0.968	4.019 MICRO-IN.	STRAIN S7B
21	16.705	79.419	229.511	36.666	87.475 Lbs.	WINCH CABLE LOAD
22	-1.863	-0.057	2.884	0.064	0.086 g.	TOP RIGHT ACC. A1
23	-1.934	-0.056	1.065	0.045	0.072 g.	TOP LEFT ACC. A2
24	-0.084	-0.054	-0.035	0.002	0.054 g.	MID. RIGHT ACC. A3
25	-0.072	-0.060	-0.044	0.002	0.060 g.	MID. LEFT ACC. A4
26	-4.374	-0.052	1.426	0.076	0.092 g.	BOTTOM RIGHT ACC. A5
27	-4.095	-0.060	3.330	0.072	0.093 g.	BOTTOM LEFT ACC. A6
28	-0.566	-0.038	0.554	0.016	0.041 g.	HORSE ACC. A7X
29	-0.580	-0.038	0.454	0.012	0.040 g.	HORSE ACC. A7Y
30	-0.909	-0.045	1.002	0.030	0.054 g.	HORSE ACC. A7Z
31	64.646	65.117	65.381	0.073	65.117 Degrees	HORSE TILT-METER T1
32	-21.079	38.557	65.968	32.047	50.136 Degrees	GATE TILT-METER T2
33	298.061	298.284	298.517	0.092	298.284 Ft. WATER	U/S POOL
34	293.785	294.529	295.250	0.517	294.529 Ft. WATER	D/S POOL
40	-0.437	-0.110	0.237	0.166	0.199 Volts	P3X
41	-0.862	-0.002	0.632	0.296	0.296 Volts	P3Y
42	-0.259	-0.095	0.618	0.090	0.131 Volts	P4X
43	-1.135	-0.137	0.215	0.166	0.216 Volts	P4Y
44	-0.288	-0.157	-0.002	0.064	0.170 Volts	P5X
45	-1.069	-0.328	0.085	0.257	0.417 Volts	P5Y
46	-0.515	-0.219	0.237	0.139	0.259 Volts	P6X
47	-0.901	0.247	0.901	0.328	0.411 Volts	P6Y
48	-81.328	-67.505	-35.692	12.749	68.698 Degrees	Winch cable angle

Information File Name: **wicketds11b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/25/00 10:27:30 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #11b Series 2b Condition B 7/25/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from up position to 65 degrees, gates 7 & 8 down during test.

CHAN NUM	STATISTICS				ROOT MEAN ENGINEERING UNITS SQUARE		TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION			
1	-75.135	-21.906	29.110	27.689	35.307 Lbs.		LOAD PIN 3X
2	-64.437	2.804	97.256	43.952	44.042 Lbs.		LOAD PIN 3Y
3	-51.941	25.625	45.993	9.990	27.503 Lbs.		LOAD PIN 4X
4	-132.489	-12.379	20.050	12.492	17.587 Lbs.		LOAD PIN 4Y
5	7.038	30.339	56.746	10.672	32.161 Lbs.		LOAD PIN 5X
6	-151.704	-50.366	16.386	37.298	62.673 Lbs.		LOAD PIN 5Y
7	-94.800	-37.203	24.970	27.314	46.153 Lbs.		LOAD PIN 6X
8	-76.730	54.122	136.637	41.601	68.263 Lbs.		LOAD PIN 6Y
9	-588.074	-213.167	-15.326	85.388	229.633 Lbs.		LOAD PIN 1
10	-52.976	8.410	81.412	32.024	33.110 LBS.		STRAIN GAGE S1
11	-33.944	-0.605	98.357	13.100	13.114 LBS.		STRAIN GAGE S2
12	0.952	3.944	10.604	2.239	4.535 MICRO-IN.		STRAIN S3
13	-25.038	-6.154	50.904	3.932	7.303 MICRO-IN.		STRAIN S4A
14	-10.198	1.309	7.029	0.588	1.435 MICRO-IN.		STRAIN S4B
15	-24.742	-10.040	41.654	6.131	11.764 MICRO-IN.		STRAIN S5A
16	-4.587	4.814	10.596	0.969	4.910 MICRO-IN.		STRAIN S5B
17	-26.019	-10.245	7.256	1.258	10.322 MICRO-IN.		STRAIN S6A
18	0.090	3.975	8.770	0.452	4.001 MICRO-IN.		STRAIN S6B
19	-26.750	-7.081	3.779	1.412	7.221 MICRO-IN.		STRAIN S7A
20	0.189	3.417	9.091	0.860	3.524 MICRO-IN.		STRAIN S7B
21	16.705	52.986	158.943	27.496	59.695 Lbs.		WINCH CABLE LOAD
22	-3.479	-0.060	2.367	0.079	0.099 g.		TOP RIGHT ACC. A1
23	-2.197	-0.057	1.398	0.054	0.079 g.		TOP LEFT ACC. A2
24	-0.068	-0.054	-0.030	0.002	0.054 g.		MID. RIGHT ACC. A3
25	-0.068	-0.060	-0.047	0.002	0.060 g.		MID. LEFT ACC. A4
26	-1.976	-0.062	2.089	0.061	0.087 g.		BOTTOM RIGHT ACC. A5
27	-3.864	-0.061	4.899	0.104	0.121 g.		BOTTOM LEFT ACC. A6
28	-0.297	-0.038	0.243	0.010	0.039 g.		HORSE ACC. A7X
29	-0.540	-0.038	0.552	0.016	0.041 g.		HORSE ACC. A7Y
30	-0.744	-0.044	1.242	0.033	0.055 g.		HORSE ACC. A7Z
31	64.646	65.100	65.332	0.055	65.100 Degrees		HORSE TILT-METER T1
32	-19.258	39.861	65.525	31.083	50.548 Degrees		GATE TILT-METER T2
33	298.061	298.363	298.737	0.219	298.363 Ft. WATER		U/S POOL
34	294.490	294.736	295.051	0.135	294.736 Ft. WATER		D/S POOL
40	-0.466	-0.135	0.178	0.172	0.219 Volts		P3X
41	-0.393	0.017	0.593	0.268	0.269 Volts		P3Y
42	-0.286	-0.158	0.271	0.062	0.169 Volts		P4X
43	-0.930	-0.077	0.125	0.078	0.109 Volts		P4Y
44	-0.315	-0.168	-0.044	0.059	0.179 Volts		P5X
45	-0.728	-0.232	0.078	0.172	0.289 Volts		P5Y
46	-0.549	-0.215	0.159	0.158	0.266 Volts		P6X
47	-0.513	0.322	0.813	0.248	0.406 Volts		P6Y
48	-81.838	-68.400	-38.536	11.338	69.333 Degrees		Winch cable angle

Information File Name: **wicketds11c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/25/00 10:30:16 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #11c Series 2b Condition B 7/25/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ 0 degrees and resting on d/s crest .

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from up position to 65 degrees, gates 7 & 8 down during test.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING	UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-62.941	-18.774	31.470	20.488	27.789	Lbs.	LOAD PIN 3X
2	-108.062	0.130	109.663	41.467	41.468	Lbs.	LOAD PIN 3Y
3	-83.660	24.873	49.562	11.334	27.334	Lbs.	LOAD PIN 4X
4	-162.367	-11.852	34.596	18.398	21.885	Lbs.	LOAD PIN 4Y
5	-3.079	30.105	54.547	11.017	32.057	Lbs.	LOAD PIN 5X
6	-194.520	-60.523	15.858	47.174	76.736	Lbs.	LOAD PIN 5Y
7	-91.837	-40.223	30.471	22.309	45.996	Lbs.	LOAD PIN 6X
8	-106.273	48.326	144.022	46.232	66.879	Lbs.	LOAD PIN 6Y
9	-728.195	-216.768	-18.829	92.154	235.544	Lbs.	LOAD PIN 1
10	-52.976	14.592	118.417	32.960	36.046	LBS.	STRAIN GAGE S1
11	-35.919	-5.431	122.053	13.176	14.251	LBS.	STRAIN GAGE S2
12	0.223	4.502	11.423	2.301	5.056	MICRO-IN.	STRAIN S3
13	-27.952	-5.598	47.626	4.813	7.382	MICRO-IN.	STRAIN S4A
14	-9.740	1.009	7.487	0.755	1.260	MICRO-IN.	STRAIN S4B
15	-32.149	-10.173	37.770	5.384	11.510	MICRO-IN.	STRAIN S5A
16	-3.496	4.962	10.323	0.996	5.061	MICRO-IN.	STRAIN S5B
17	-23.261	-10.183	8.175	1.287	10.264	MICRO-IN.	STRAIN S6A
18	0.722	3.865	9.403	0.451	3.891	MICRO-IN.	STRAIN S6B
19	-28.573	-7.145	5.237	1.485	7.298	MICRO-IN.	STRAIN S7A
20	-1.174	3.558	9.727	0.951	3.683	MICRO-IN.	STRAIN S7B
21	12.294	48.064	194.227	39.478	62.199	Lbs.	WINCH CABLE LOAD
22	-2.635	-0.058	3.071	0.074	0.094	g.	TOP RIGHT ACC. A1
23	-3.540	-0.058	2.551	0.081	0.099	g.	TOP LEFT ACC. A2
24	-0.080	-0.054	-0.005	0.002	0.054	g.	MID. RIGHT ACC. A3
25	-0.075	-0.060	-0.030	0.002	0.060	g.	MID. LEFT ACC. A4
26	-3.542	-0.061	2.741	0.066	0.090	g.	BOTTOM RIGHT ACC. A5
27	-2.778	-0.060	4.777	0.094	0.112	g.	BOTTOM LEFT ACC. A6
28	-0.364	-0.038	0.155	0.010	0.039	g.	HORSE ACC. A7X
29	-0.674	-0.038	0.422	0.015	0.041	g.	HORSE ACC. A7Y
30	-0.780	-0.044	1.002	0.033	0.055	g.	HORSE ACC. A7Z
31	64.548	65.092	65.332	0.060	65.092	Degrees	HORSE TILT-METER T1
32	-18.520	39.874	65.771	30.991	50.501	Degrees	GATE TILT-METER T2
33	297.826	298.271	298.800	0.301	298.271	Ft. WATER	U/S POOL
34	294.219	294.748	295.304	0.285	294.748	Ft. WATER	D/S POOL
40	-0.388	-0.116	0.210	0.127	0.172	Volts	P3X
41	-0.681	0.001	0.669	0.253	0.253	Volts	P3Y
42	-0.300	-0.153	0.425	0.070	0.168	Volts	P4X
43	-0.994	-0.074	0.215	0.114	0.136	Volts	P4Y
44	-0.303	-0.167	-0.002	0.061	0.178	Volts	P5X
45	-0.889	-0.279	0.073	0.218	0.354	Volts	P5Y
46	-0.527	-0.232	0.193	0.129	0.265	Volts	P6X
47	-0.620	0.288	0.857	0.275	0.398	Volts	P6Y
48	-81.711	-68.553	-40.574	11.032	69.435	Degrees	Winch cable angle

Information File Name: **wicketds13a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/27/00 9:07:29 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #13a Series 2b Condition C 7/27/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ up position, and lowering gate to 65 degrees

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from up position to 65 degrees, gates 7 & 8 down during test. In bottom lift mode.

CHAN NUM	STATISTICS					ENGINEERING UNITS	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION	ROOT MEAN SQUARE		
1	-121.947	-24.318	60.974	54.247	59.449	Lbs.	LOAD PIN 3X
2	-185.707	18.761	228.932	83.731	85.807	Lbs.	LOAD PIN 3Y
3	-119.741	0.782	65.818	34.304	34.313	Lbs.	LOAD PIN 4X
4	-283.455	-76.549	87.670	39.865	86.308	Lbs.	LOAD PIN 4Y
5	-18.915	20.099	52.787	17.036	26.348	Lbs.	LOAD PIN 5X
6	-322.437	-115.331	44.401	83.318	142.278	Lbs.	LOAD PIN 5Y
7	-147.278	-44.753	55.018	57.614	72.953	Lbs.	LOAD PIN 6X
8	-262.195	8.278	179.310	94.942	95.302	Lbs.	LOAD PIN 6Y
9	-831.144	-412.403	-108.905	135.446	434.076	Lbs.	LOAD PIN 1
10	-134.921	14.090	162.442	69.306	70.724	LBS.	STRAIN GAGE S1
11	-55.665	29.636	216.836	36.201	46.785	LBS.	STRAIN GAGE S2
12	-2.865	8.282	16.394	3.560	9.014	MICRO-IN.	STRAIN S3
13	-26.332	-8.857	20.068	5.147	10.244	MICRO-IN.	STRAIN S4A
14	-2.231	4.050	9.497	0.575	4.091	MICRO-IN.	STRAIN S4B
15	-39.588	-16.850	31.907	7.863	18.595	MICRO-IN.	STRAIN S5A
16	0.851	6.998	11.135	1.875	7.245	MICRO-IN.	STRAIN S5B
17	-27.405	-13.161	-1.327	3.102	13.522	MICRO-IN.	STRAIN S6A
18	1.358	4.488	6.975	0.832	4.565	MICRO-IN.	STRAIN S6B
19	-22.128	-10.741	1.124	4.264	11.556	MICRO-IN.	STRAIN S7A
20	1.109	5.942	8.728	1.667	6.172	MICRO-IN.	STRAIN S7B
21	-14.922	102.438	299.625	59.753	118.592	Lbs.	WINCH CABLE LOAD
22	-1.975	-0.059	2.131	0.060	0.084	g.	TOP RIGHT ACC. A1
23	-3.610	-0.065	1.479	0.060	0.089	g.	TOP LEFT ACC. A2
26	-3.159	-0.069	1.382	0.060	0.092	g.	BOTTOM RIGHT ACC. A5
27	-2.182	-0.059	2.311	0.057	0.082	g.	BOTTOM LEFT ACC. A6
28	-0.296	-0.037	0.301	0.012	0.039	g.	HORSE ACC. A7X
29	-0.484	-0.037	0.357	0.013	0.039	g.	HORSE ACC. A7Y
30	-1.073	-0.043	0.690	0.088	0.098	g.	HORSE ACC. A7Z
31	64.940	65.118	65.430	0.056	65.118	Degrees	HORSE TILT-METER T1
32	-35.496	39.085	65.328	32.759	50.998	Degrees	GATE TILT-METER T2
33	299.806	300.423	301.221	0.437	300.424	Ft. WATER	U/S POOL
34	294.237	294.757	295.232	0.193	294.757	Ft. WATER	D/S POOL
40	-0.752	-0.151	0.386	0.337	0.369	Volts	P3X
41	-1.152	0.114	1.401	0.511	0.524	Volts	P3Y
42	-0.405	-0.005	0.757	0.211	0.211	Volts	P4X
43	-1.758	-0.476	0.540	0.248	0.536	Volts	P4Y
44	-0.291	-0.112	0.095	0.095	0.146	Volts	P5X
45	-1.477	-0.532	0.205	0.385	0.657	Volts	P5Y
46	-0.850	-0.258	0.327	0.333	0.421	Volts	P6X
47	-1.563	0.049	1.067	0.565	0.567	Volts	P6Y
48	-80.182	-66.696	-13.574	15.302	68.429	Degrees	Winch cable angle

Information File Name: **wicketds13b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/27/00 9:09:59 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #13b Series 2b Condition C 7/27/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ up position, and lowering gate to 65 degrees

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from up position to 65 degrees, gates 7 & 8 down during test. In bottom lift mode.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN	ENGINEERING UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-130.208	-35.031	51.139	50.365	61.350	Lbs.	LOAD PIN 3X
2	-156.890	22.970	202.116	73.145	76.667	Lbs.	LOAD PIN 3Y
3	-104.674	7.512	68.990	30.377	31.292	Lbs.	LOAD PIN 4X
4	-255.149	-70.062	27.913	35.022	78.328	Lbs.	LOAD PIN 4Y
5	-11.437	20.681	57.186	16.422	26.408	Lbs.	LOAD PIN 5X
6	-254.778	-94.227	42.815	73.852	119.720	Lbs.	LOAD PIN 5Y
7	-129.080	-44.813	50.785	54.970	70.922	Lbs.	LOAD PIN 6X
8	-212.956	9.271	167.000	90.089	90.564	Lbs.	LOAD PIN 6Y
9	-748.852	-408.236	-106.279	135.252	430.058	Lbs.	LOAD PIN 1
10	-136.865	3.849	127.458	64.574	64.689	LBS.	STRAIN GAGE S1
11	-43.817	29.765	187.216	35.161	46.068	LBS.	STRAIN GAGE S2
12	1.790	7.415	14.934	3.194	8.073	MICRO-IN.	STRAIN S3
13	-22.155	-10.342	29.512	5.488	11.708	MICRO-IN.	STRAIN S4A
14	-4.063	4.563	8.580	0.625	4.606	MICRO-IN.	STRAIN S4B
15	-35.430	-14.233	20.337	9.686	17.216	MICRO-IN.	STRAIN S5A
16	1.397	6.444	11.226	1.802	6.691	MICRO-IN.	STRAIN S5B
17	-25.951	-13.442	0.762	3.123	13.800	MICRO-IN.	STRAIN S6A
18	1.267	4.885	7.428	0.977	4.981	MICRO-IN.	STRAIN S6B
19	-24.762	-10.668	1.579	4.233	11.477	MICRO-IN.	STRAIN S7A
20	1.018	5.396	9.273	1.540	5.612	MICRO-IN.	STRAIN S7B
21	-17.129	56.249	266.515	53.691	77.760	Lbs.	WINCH CABLE LOAD
22	-1.518	-0.059	2.462	0.058	0.083	g.	TOP RIGHT ACC. A1
23	-3.275	-0.056	1.153	0.052	0.076	g.	TOP LEFT ACC. A2
26	-4.330	-0.061	0.892	0.062	0.087	g.	BOTTOM RIGHT ACC. A5
27	-2.156	-0.059	2.475	0.053	0.080	g.	BOTTOM LEFT ACC. A6
28	-0.390	-0.037	0.530	0.013	0.039	g.	HORSE ACC. A7X
29	-0.343	-0.037	0.298	0.010	0.039	g.	HORSE ACC. A7Y
30	-1.057	-0.046	0.736	0.075	0.088	g.	HORSE ACC. A7Z
31	64.597	65.110	65.381	0.056	65.110	Degrees	HORSE TILT-METER T1
32	-35.693	38.514	65.476	32.885	50.643	Degrees	GATE TILT-METER T2
33	300.073	300.464	300.796	0.210	300.464	Ft. WATER	U/S POOL
34	294.002	294.669	295.413	0.435	294.669	Ft. WATER	D/S POOL
40	-0.808	-0.218	0.325	0.312	0.381	Volts	P3X
41	-0.957	0.140	1.233	0.446	0.468	Volts	P3Y
42	-0.425	-0.046	0.669	0.187	0.193	Volts	P4X
43	-1.621	-0.435	0.176	0.218	0.486	Volts	P4Y
44	-0.315	-0.115	0.068	0.091	0.147	Volts	P5X
45	-1.179	-0.435	0.198	0.342	0.553	Volts	P5Y
46	-0.745	-0.258	0.288	0.317	0.409	Volts	P6X
47	-1.287	0.055	0.994	0.536	0.539	Volts	P6Y
48	-91.305	-67.121	-16.716	14.303	68.628	Degrees	Winch cable angle

Information File Name: **wicketds13c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 7/27/00 9:12:00 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #13c Series 2b Condition C 7/27/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 filtered at 200 Hz. Low Pass

Gate #6 @ up position, and lowering gate to 65 degrees

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from up position to 65 degrees, gates 7 & 8 down during test. In bottom lift mode.

CHAN	STATISTICS					ENGINEERING UNITS	TYPE OF GAGE
	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN		
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-143.190	-32.456	72.775	61.401	69.451	Lbs.	LOAD PIN 3X
2	-182.905	9.013	211.322	85.616	86.089	Lbs.	LOAD PIN 3Y
3	-128.464	-3.262	64.232	39.693	39.826	Lbs.	LOAD PIN 4X
4	-281.096	-89.178	70.372	39.422	97.503	Lbs.	LOAD PIN 4Y
5	-10.997	23.116	63.784	19.031	29.942	Lbs.	LOAD PIN 5X
6	-346.224	-125.684	30.658	86.965	152.838	Lbs.	LOAD PIN 5Y
7	-159.128	-49.605	46.553	60.432	78.183	Lbs.	LOAD PIN 6X
8	-236.755	4.079	168.642	91.363	91.454	Lbs.	LOAD PIN 6Y
9	-837.272	-425.942	-127.289	144.160	449.677	Lbs.	LOAD PIN 1
10	-117.429	19.899	179.934	73.243	75.898	LBS.	STRAIN GAGE S1
11	-71.462	37.998	203.013	36.986	53.027	LBS.	STRAIN GAGE S2
12	2.064	8.950	17.672	3.753	9.705	MICRO-IN.	STRAIN S3
13	-24.334	-8.628	26.243	6.023	10.522	MICRO-IN.	STRAIN S4A
14	-2.964	3.945	7.664	0.555	3.984	MICRO-IN.	STRAIN S4B
15	-43.655	-15.639	33.805	7.905	17.523	MICRO-IN.	STRAIN S5A
16	-0.878	6.860	13.229	1.955	7.133	MICRO-IN.	STRAIN S5B
17	-24.406	-12.830	3.761	2.825	13.137	MICRO-IN.	STRAIN S6A
18	1.902	4.476	7.428	0.838	4.554	MICRO-IN.	STRAIN S6B
19	-22.309	-10.446	0.489	4.170	11.248	MICRO-IN.	STRAIN S7A
20	-0.071	5.838	9.091	1.744	6.093	MICRO-IN.	STRAIN S7B
21	-17.129	104.484	316.180	65.181	123.148	Lbs.	WINCH CABLE LOAD
22	-1.259	-0.059	3.241	0.058	0.083	g.	TOP RIGHT ACC. A1
23	-4.347	-0.057	0.859	0.062	0.085	g.	TOP LEFT ACC. A2
26	-2.877	-0.059	0.877	0.057	0.082	g.	BOTTOM RIGHT ACC. A5
27	-2.190	-0.059	2.037	0.059	0.083	g.	BOTTOM LEFT ACC. A6
28	-0.263	-0.037	0.389	0.013	0.039	g.	HORSE ACC. A7X
29	-0.319	-0.037	0.305	0.010	0.038	g.	HORSE ACC. A7Y
30	-1.069	-0.045	1.042	0.061	0.076	g.	HORSE ACC. A7Z
31	64.842	65.098	65.626	0.059	65.098	Degrees	HORSE TILT-METER T1
32	-35.545	39.061	65.476	32.756	50.977	Degrees	GATE TILT-METER T2
33	300.183	300.480	300.765	0.157	300.480	Ft. WATER	U/S POOL
34	293.694	294.426	295.232	0.453	294.426	Ft. WATER	D/S POOL
40	-0.891	-0.201	0.454	0.381	0.431	Volts	P3X
41	-1.125	0.055	1.287	0.522	0.525	Volts	P3Y
42	-0.398	0.020	0.735	0.244	0.245	Volts	P4X
43	-1.577	-0.554	0.437	0.245	0.606	Volts	P4Y
44	-0.352	-0.128	0.056	0.106	0.166	Volts	P5X
45	-1.606	-0.580	0.144	0.402	0.706	Volts	P5Y
46	-0.920	-0.286	0.256	0.349	0.451	Volts	P6X
47	-1.277	0.024	1.028	0.544	0.544	Volts	P6Y
48	-81.328	-66.736	-12.683	14.926	68.384	Degrees	Winch cable angle

Information File Name: **wicketus40a.inf**

Sample Rate: 500.000 samples/sec/channel

Length of Time Recorded: 00:00:30.00

Data Collected on 3/2/01 1:53:12 PM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST wicketus40a 03/02/01

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1-33 and 40- 47 filtered at 200 Hz. Low Pass

Gate #6 @ down position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 300 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees,

Gates 1,7,8 down during test.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING	UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-55.860	-20.561	25.176	8.094	22.097	Lbs.	LOAD PIN 3X
2	-32.419	33.965	311.780	22.456	40.717	Lbs.	LOAD PIN 3Y
3	-38.856	12.019	74.144	23.257	26.179	Lbs.	LOAD PIN 4X
4	-82.166	32.217	161.581	30.775	44.554	Lbs.	LOAD PIN 4Y
5	-24.194	37.220	83.140	16.358	40.656	Lbs.	LOAD PIN 5X
6	-63.959	21.007	275.393	24.891	32.571	Lbs.	LOAD PIN 5Y
7	-81.680	-40.077	8.041	12.515	41.986	Lbs.	LOAD PIN 6X
8	-88.629	7.293	146.895	22.122	23.293	Lbs.	LOAD PIN 6Y
9	-1114.310	7.201	89.924	29.541	30.406	Lbs.	LOAD PIN 1
10	-520.295	-30.574	67.587	20.082	36.579	LBS.	STRAIN GAGE S1
11	-115.667	-18.904	56.013	16.880	25.343	LBS.	STRAIN GAGE S2
12	-5.830	-0.786	9.437	1.212	1.445	MICRO-IN.	STRAIN S3
13	-52.810	-2.265	30.222	7.102	7.454	MICRO-IN.	STRAIN S4A
14	-6.109	2.259	13.706	1.869	2.932	MICRO-IN.	STRAIN S4B
15	-64.190	-9.496	21.322	7.771	12.270	MICRO-IN.	STRAIN S5A
16	-6.308	2.383	10.126	1.889	3.041	MICRO-IN.	STRAIN S5B
17	-22.685	-7.061	15.338	5.656	9.048	MICRO-IN.	STRAIN S6A
18	-6.688	1.728	6.648	1.759	2.466	MICRO-IN.	STRAIN S6B
19	-16.989	-0.723	22.925	4.736	4.790	MICRO-IN.	STRAIN S7A
20	-7.395	0.889	6.711	1.589	1.821	MICRO-IN.	STRAIN S7B
21	-67.773	64.040	187.018	57.631	86.154	Lbs.	WINCH CABLE LOAD
22	-1.125	-0.039	1.026	0.056	0.068	g.	TOP RIGHT ACC. A1
23	-2.305	-0.054	2.949	0.075	0.092	g.	TOP LEFT ACC. A2
26	-2.204	-0.046	3.368	0.078	0.090	g.	BOTTOM RIGHT ACC. A5
27	-1.717	-0.038	1.378	0.062	0.073	g.	BOTTOM LEFT ACC. A6
31	-0.580	38.945	68.062	25.078	46.321	Degrees	HORSE TILT-METER T1
32	-29.793	-20.209	0.560	8.178	21.801	Degrees	GATE TILT-METER T2
33	298.881	300.206	301.271	0.224	300.206	Ft. WATER	U/S POOL
34	298.777	300.136	301.333	0.246	300.136	Ft. WATER	D/S POOL
40	-0.369	-0.128	0.159	0.050	0.137	Volts	P3X
41	-0.190	0.207	1.914	0.137	0.248	Volts	P3Y
42	-0.454	-0.074	0.269	0.143	0.161	Volts	P4X
43	-0.513	0.200	1.025	0.191	0.277	Volts	P4Y
44	-0.469	-0.207	0.144	0.091	0.226	Volts	P5X
45	-0.291	0.097	1.240	0.115	0.150	Volts	P5Y
46	-0.474	-0.231	0.061	0.072	0.242	Volts	P6X
47	-1.921	-1.162	-0.300	0.180	1.176	Volts	P6Y
48	-63.989	-48.152	-39.155	6.929	48.648	Degrees	Winch cable angle

Information File Name: **wicketus14a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 8/2/00 10:46:34 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #14A Series 3A Condition A 8/2/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 & 49 filtered at 200 Hz. Low Pass

Gate #6 @ down position, and raise gate to 65 degrees horse.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 290 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from down position to 65 degrees horse, gates none down during test. In bottom lift mode.

STATISTICS						TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
1	-91.657	-55.089	10.621	26.720	61.227 Lbs.	LOAD PIN 3X
2	-114.466	20.254	157.291	51.310	55.162 Lbs.	LOAD PIN 3Y
3	-116.172	-36.002	32.116	46.142	58.525 Lbs.	LOAD PIN 4X
4	-123.839	37.909	182.417	65.001	75.248 Lbs.	LOAD PIN 4Y
5	-17.156	1.576	19.795	7.364	7.530 Lbs.	LOAD PIN 5X
6	-88.802	30.760	133.204	56.345	64.194 Lbs.	LOAD PIN 5Y
7	-122.308	-77.170	13.543	32.626	83.783 Lbs.	LOAD PIN 6X
8	-97.656	32.058	146.074	60.886	68.810 Lbs.	LOAD PIN 6Y
9	-463.380	-40.606	70.367	112.539	119.641 Lbs.	LOAD PIN 1
10	-204.247	-32.378	52.570	38.217	50.089 LBS.	STRAIN GAGE S1
11	-106.723	-19.686	74.665	40.014	44.594 LBS.	STRAIN GAGE S2
12	-5.752	-0.709	5.015	2.057	2.176 MICRO-IN.	STRAIN S3
13	-27.800	-1.951	25.221	10.917	11.090 MICRO-IN.	STRAIN S4A
14	-6.088	1.452	12.495	2.561	2.944 MICRO-IN.	STRAIN S4B
15	-38.637	-7.458	22.061	13.688	15.588 MICRO-IN.	STRAIN S5A
16	-4.911	2.443	7.980	3.031	3.893 MICRO-IN.	STRAIN S5B
17	-21.593	-7.413	13.261	8.829	11.529 MICRO-IN.	STRAIN S6A
18	-4.429	2.818	6.339	2.480	3.754 MICRO-IN.	STRAIN S6B
19	-12.144	-0.566	19.165	7.514	7.535 MICRO-IN.	STRAIN S7A
20	-5.283	1.551	5.063	2.473	2.919 MICRO-IN.	STRAIN S7B
21	5.737	260.483	466.031	165.797	308.771 Lbs.	WINCH CABLE LOAD
22	-0.718	-0.054	0.601	0.035	0.064 g.	TOP RIGHT ACC. A1
23	-0.670	-0.052	0.608	0.042	0.067 g.	TOP LEFT ACC. A2
24	-4.794	-0.685	4.792	2.726	2.810 g.	MID. RIGHT ACC. A3
25	-4.771	-0.386	4.769	2.604	2.632 g.	MID. LEFT ACC. A4
26	-0.620	-0.019	0.504	0.099	0.100 g.	BOTTOM RIGHT ACC. A5
27	-0.822	-0.053	0.756	0.038	0.066 g.	BOTTOM LEFT ACC. A6
28	-0.359	-0.034	0.219	0.026	0.043 g.	HORSE ACC. A7X
29	-0.223	-0.029	0.191	0.019	0.034 g.	HORSE ACC. A7Y
30	-0.686	-0.042	0.384	0.055	0.069 g.	HORSE ACC. A7Z
31	-0.095	37.583	66.655	24.257	44.731 Degrees	HORSE TILT-METER T1
32	-38.202	-24.145	0.130	11.176	26.606 Degrees	GATE TILT-METER T2
33	299.983	300.146	300.416	0.120	300.146 Ft. WATER	U/S POOL
34	289.642	289.947	290.329	0.211	289.947 Ft. WATER	D/S POOL
35	16.700	45.706	600.635	8.742	46.535 Lbs.	BUMPER PLATE R. SHEA
36	7.771	20.832	50.075	4.601	21.334 Lbs.	BUMPER PLATE L. SHEA
37	-10.548	9.848	52.156	8.728	13.159 Lbs.	BUMPER PLATE R. MOME
38	-9.605	4.399	85.121	16.299	16.883 Lbs.	BUMPER PLATE L. MOME
39	5.253	5.264	5.274	0.003	5.264 IN. VEL.	LASER VELOCITY @ 10
40	-0.554	-0.334	0.068	0.164	0.372 Volts	P3X
41	-0.698	0.123	0.986	0.313	0.337 Volts	P3Y
42	-0.193	0.222	0.708	0.284	0.360 Volts	P4X
43	-0.769	0.236	1.135	0.404	0.467 Volts	P4Y
44	-0.110	-0.009	0.095	0.041	0.042 Volts	P5X
45	-0.410	0.142	0.615	0.260	0.296 Volts	P5Y
46	-0.706	-0.445	0.078	0.188	0.483 Volts	P6X
47	-0.579	0.191	0.872	0.363	0.410 Volts	P6Y
48	-61.885	-28.627	-6.018	17.076	33.333 Degrees	Winch cable angle
49	-0.056	-0.048	-0.034	0.004	0.048 mm	Laser displacement



Information File Name: **wicketus14b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 8/2/00 10:48:16 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #14A Series 3b Condition A 8/2/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 & 49 filtered at 200 Hz. Low Pass

Gate #6 @ down position, and raise gate to 65 degrees horse.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 290 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from down position to 65 degrees horse, gates none down during test. In bottom lift mode.

STATISTICS							TYPE OF GAGE
CHAN NUM	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION	ROOT MEAN SQUARE	ENGINEERING UNITS	
1	-94.017	-57.240	11.801	26.672	63.149	Lbs.	LOAD PIN 3X
2	-81.247	27.923	168.497	53.302	60.173	Lbs.	LOAD PIN 3Y
3	-116.569	-38.444	53.527	49.515	62.687	Lbs.	LOAD PIN 4X
4	-124.233	43.282	179.665	61.552	75.246	Lbs.	LOAD PIN 4Y
5	-21.115	2.812	25.514	8.089	8.564	Lbs.	LOAD PIN 5X
6	-95.145	38.147	147.475	58.343	69.707	Lbs.	LOAD PIN 5Y
7	-124.848	-81.503	11.004	33.747	88.213	Lbs.	LOAD PIN 6X
8	-104.221	38.574	148.126	58.703	70.242	Lbs.	LOAD PIN 6Y
9	-485.255	-30.349	72.117	96.502	101.162	Lbs.	LOAD PIN 1
10	-126.424	-37.441	50.624	41.871	56.169	LBS.	STRAIN GAGE S1
11	-100.809	-21.308	78.608	36.781	42.508	LBS.	STRAIN GAGE S2
12	-5.661	-0.660	4.832	2.012	2.117	MICRO-IN.	STRAIN S3
13	-38.422	-1.395	26.038	10.984	11.072	MICRO-IN.	STRAIN S4A
14	-5.996	1.405	9.749	2.692	3.036	MICRO-IN.	STRAIN S4B
15	-46.235	-6.667	26.403	13.407	14.973	MICRO-IN.	STRAIN S5A
16	-5.728	2.519	8.887	3.066	3.968	MICRO-IN.	STRAIN S5B
17	-22.410	-7.727	16.165	9.261	12.061	MICRO-IN.	STRAIN S6A
18	-5.153	2.944	6.248	2.575	3.911	MICRO-IN.	STRAIN S6B
19	-15.330	-0.974	20.257	7.492	7.555	MICRO-IN.	STRAIN S7A
20	-6.100	1.628	5.608	2.480	2.967	MICRO-IN.	STRAIN S7B
21	12.344	282.152	500.168	163.684	326.194	Lbs.	WINCH CABLE LOAD
22	-1.019	-0.054	0.767	0.038	0.066	g.	TOP RIGHT ACC. A1
23	-0.785	-0.053	0.881	0.044	0.069	g.	TOP LEFT ACC. A2
24	-4.794	-1.267	4.792	3.015	3.270	g.	MID. RIGHT ACC. A3
25	-4.771	-0.385	4.769	2.629	2.657	g.	MID. LEFT ACC. A4
26	-1.127	-0.022	0.817	0.095	0.098	g.	BOTTOM RIGHT ACC. A5
27	-1.113	-0.053	0.951	0.039	0.066	g.	BOTTOM LEFT ACC. A6
28	-0.380	-0.034	0.174	0.025	0.042	g.	HORSE ACC. A7X
29	-0.513	-0.029	0.318	0.020	0.035	g.	HORSE ACC. A7Y
30	-0.655	-0.041	0.995	0.058	0.071	g.	HORSE ACC. A7Z
31	-0.046	37.546	67.929	24.241	44.692	Degrees	HORSE TILT-METER T1
32	-35.250	-23.270	0.130	10.184	25.401	Degrees	GATE TILT-METER T2
33	300.079	300.240	300.512	0.099	300.240	Ft. WATER	U/S POOL
34	289.569	289.936	290.275	0.169	289.936	Ft. WATER	D/S POOL
35	18.912	48.016	662.568	8.890	48.832	Lbs.	BUMPER PLATE R. SHEA
36	7.771	21.179	30.036	4.249	21.601	Lbs.	BUMPER PLATE L. SHEA
37	-12.787	9.758	49.917	8.244	12.774	Lbs.	BUMPER PLATE R. MOME
38	-33.837	4.658	82.918	15.285	15.979	Lbs.	BUMPER PLATE L. MOME
39	5.250	5.264	5.272	0.003	5.264	IN. VEL.	LASER VELOCITY @ 10
40	-0.571	-0.347	0.073	0.163	0.383	Volts	P3X
41	-0.493	0.170	1.060	0.325	0.367	Volts	P3Y
42	-0.330	0.237	0.718	0.305	0.386	Volts	P4X
43	-0.771	0.269	1.116	0.382	0.467	Volts	P4Y
44	-0.144	-0.016	0.107	0.045	0.048	Volts	P5X
45	-0.439	0.176	0.679	0.269	0.322	Volts	P5Y
46	-0.723	-0.470	0.061	0.195	0.509	Volts	P6X
47	-0.618	0.230	0.881	0.349	0.418	Volts	P6Y
48	-61.970	-29.839	-10.518	15.675	33.706	Degrees	Winch cable angle
49	-0.059	-0.047	-0.037	0.004	0.048	mm	Laser displacement

Information File Name: **wicketus14c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 8/2/00 10:53:22 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #14A Series 3c Condition A 8/2/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 & 49 filtered at 200 Hz. Low Pass

Gate #6 @ down position, and raise gate to 65 degrees horse.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 290 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from down position to 65 degrees horse, gates none down during test. In bottom lift mode.

CHAN NUM	STATISTICS				ROOT MEAN SQUARE	ENGINEERING UNITS	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION			
1	-87.330	-54.116	8.261	24.506	59.406	Lbs.	LOAD PIN 3X
2	-90.852	16.980	125.672	48.089	50.998	Lbs.	LOAD PIN 3Y
3	-125.292	-41.808	48.372	54.176	68.432	Lbs.	LOAD PIN 4X
4	-147.428	39.804	193.425	64.405	75.712	Lbs.	LOAD PIN 4Y
5	-18.476	3.961	29.913	10.552	11.271	Lbs.	LOAD PIN 5X
6	-113.646	26.386	126.861	57.439	63.210	Lbs.	LOAD PIN 5Y
7	-120.616	-81.190	2.962	31.337	87.027	Lbs.	LOAD PIN 6X
8	-96.836	36.589	146.074	51.887	63.490	Lbs.	LOAD PIN 6Y
9	-293.631	-30.462	65.117	99.038	103.617	Lbs.	LOAD PIN 1
10	-112.805	-28.648	70.080	40.052	49.243	LBS.	STRAIN GAGE S1
11	-94.894	-19.168	80.580	33.033	38.191	LBS.	STRAIN GAGE S2
12	-5.661	-0.531	6.110	2.819	2.868	MICRO-IN.	STRAIN S3
13	-20.536	-1.029	26.038	11.930	11.974	MICRO-IN.	STRAIN S4A
14	-6.454	1.021	5.904	2.952	3.123	MICRO-IN.	STRAIN S4B
15	-29.229	-6.514	18.262	13.412	14.910	MICRO-IN.	STRAIN S5A
16	-4.094	2.437	8.161	3.095	3.939	MICRO-IN.	STRAIN S5B
17	-22.047	-7.268	15.348	9.218	11.739	MICRO-IN.	STRAIN S6A
18	-5.063	2.830	6.429	2.770	3.960	MICRO-IN.	STRAIN S6B
19	-12.963	-0.620	18.255	7.633	7.659	MICRO-IN.	STRAIN S7A
20	-4.920	1.570	4.700	2.471	2.928	MICRO-IN.	STRAIN S7B
21	2.434	265.963	442.906	154.221	307.442	Lbs.	WINCH CABLE LOAD
22	-0.478	-0.054	0.543	0.034	0.064	g.	TOP RIGHT ACC. A1
23	-0.529	-0.054	0.306	0.036	0.065	g.	TOP LEFT ACC. A2
24	-4.794	-0.924	4.792	3.124	3.258	g.	MID. RIGHT ACC. A3
25	-4.771	-0.306	4.769	2.735	2.753	g.	MID. LEFT ACC. A4
26	-0.420	-0.019	0.494	0.092	0.094	g.	BOTTOM RIGHT ACC. A5
27	-0.933	-0.054	0.379	0.033	0.063	g.	BOTTOM LEFT ACC. A6
28	-0.353	-0.033	0.157	0.027	0.043	g.	HORSE ACC. A7X
29	-0.580	-0.029	0.359	0.018	0.034	g.	HORSE ACC. A7Y
30	-0.549	-0.042	0.573	0.056	0.069	g.	HORSE ACC. A7Z
31	-0.046	37.278	68.223	24.459	44.586	Degrees	HORSE TILT-METER T1
32	-35.939	-23.377	0.130	10.585	25.662	Degrees	GATE TILT-METER T2
33	300.063	300.231	300.464	0.109	300.231	Ft. WATER	U/S POOL
34	289.569	289.974	290.456	0.262	289.975	Ft. WATER	D/S POOL
35	21.123	52.547	507.736	8.457	53.223	Lbs.	BUMPER PLATE R. SHEA
36	9.997	22.582	47.849	4.610	23.048	Lbs.	BUMPER PLATE L. SHEA
37	-8.308	10.099	52.156	8.999	13.527	Lbs.	BUMPER PLATE R. MOME
38	-9.605	7.145	87.324	18.032	19.395	Lbs.	BUMPER PLATE L. MOME
39	5.250	5.264	5.280	0.003	5.264	IN. VEL.	LASER VELOCITY @ 10
40	-0.530	-0.328	0.056	0.150	0.361	Volts	P3X
41	-0.554	0.103	0.767	0.293	0.311	Volts	P3Y
42	-0.298	0.257	0.774	0.334	0.421	Volts	P4X
43	-0.916	0.247	1.204	0.400	0.470	Volts	P4Y
44	-0.164	-0.022	0.103	0.059	0.063	Volts	P5X
45	-0.525	0.122	0.588	0.265	0.292	Volts	P5Y
46	-0.701	-0.468	0.015	0.181	0.502	Volts	P6X
47	-0.579	0.218	0.869	0.309	0.378	Volts	P6Y
48	-61.503	-29.714	-9.669	16.194	33.841	Degrees	Winch cable angle
49	-0.059	-0.048	-0.037	0.004	0.048	mm	Laser displacement

Information File Name: **wicketus41a.inf**

Sample Rate: 500.000 samples/sec/channel

Length of Time Recorded: 00:00:30.00

Data Collected on 3/2/01 2:04:13 PM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST wicketus41a 03/02/01

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1-33 and 40- 47 filtered at 200 Hz. Low Pass

Gate #6 @ down position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 290 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees,

Gates down during test. none

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
1	-95.591	-51.958	39.731	30.656	60.328 Lbs.	LOAD PIN 3X
2	-112.065	26.521	152.888	50.317	56.878 Lbs.	LOAD PIN 3Y
3	-139.169	-44.771	49.562	52.159	68.739 Lbs.	LOAD PIN 4X
4	-97.106	46.318	192.246	69.041	83.139 Lbs.	LOAD PIN 4Y
5	-33.872	1.239	31.672	8.734	8.821 Lbs.	LOAD PIN 5X
6	-110.474	33.769	135.318	52.897	62.758 Lbs.	LOAD PIN 5Y
7	-121.885	-68.833	26.239	39.011	79.119 Lbs.	LOAD PIN 6X
8	-116.941	25.590	156.742	71.686	76.117 Lbs.	LOAD PIN 6Y
9	-422.934	-29.696	92.194	109.790	113.735 Lbs.	LOAD PIN 1
10	-129.996	-39.737	98.733	40.001	56.384 LBS.	STRAIN GAGE S1
11	-162.041	-38.247	76.733	52.866	65.250 LBS.	STRAIN GAGE S2
12	-7.920	-1.250	4.803	2.466	2.764 MICRO-IN.	STRAIN S3
13	-27.713	-1.423	23.699	10.672	10.767 MICRO-IN.	STRAIN S4A
14	-5.788	2.265	8.294	2.748	3.561 MICRO-IN.	STRAIN S4B
15	-38.277	-6.919	22.425	13.940	15.563 MICRO-IN.	STRAIN S5A
16	-6.533	2.187	8.501	3.273	3.936 MICRO-IN.	STRAIN S5B
17	-25.003	-6.589	16.166	9.349	11.437 MICRO-IN.	STRAIN S6A
18	-6.507	2.275	6.920	2.794	3.603 MICRO-IN.	STRAIN S6B
19	-14.491	-0.537	23.813	8.246	8.263 MICRO-IN.	STRAIN S7A
20	-7.580	1.511	5.925	2.715	3.107 MICRO-IN.	STRAIN S7B
21	-39.543	249.203	490.305	167.572	300.304 Lbs.	WINCH CABLE LOAD
22	-0.878	-0.041	0.834	0.051	0.065 g.	TOP RIGHT ACC. A1
23	-0.718	-0.042	0.759	0.060	0.074 g.	TOP LEFT ACC. A2
26	-0.828	-0.043	0.935	0.073	0.085 g.	BOTTOM RIGHT ACC. A5
27	-0.882	-0.040	1.139	0.054	0.067 g.	BOTTOM LEFT ACC. A6
31	-1.503	34.083	68.694	24.810	42.156 Degrees	HORSE TILT-METER T1
32	-33.147	-21.199	0.706	10.770	23.778 Degrees	GATE TILT-METER T2
33	299.011	300.268	301.465	0.233	300.268 Ft. WATER	U/S POOL
34	288.683	290.164	291.598	0.355	290.164 Ft. WATER	D/S POOL
40	-0.591	-0.323	0.247	0.190	0.374 Volts	P3X
41	-0.684	0.162	0.930	0.307	0.347 Volts	P3Y
42	-0.291	0.276	0.854	0.321	0.423 Volts	P4X
43	-0.598	0.288	1.199	0.429	0.516 Volts	P4Y
44	-0.164	-0.007	0.176	0.048	0.049 Volts	P5X
45	-0.508	0.156	0.625	0.244	0.290 Volts	P5Y
46	-0.706	-0.397	0.151	0.225	0.457 Volts	P6X
47	-2.017	-1.305	-0.110	0.474	1.388 Volts	P6Y
48	-62.978	-44.614	-27.738	10.355	45.800 Degrees	Winch cable angle

Information File Name: **wicketus41b.inf**

Sample Rate: 500.000 samples/sec/channel

Length of Time Recorded: 00:00:30.00

Data Collected on 3/2/01 2:09:52 PM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST wicketus41b 03/02/01

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1-33 and 40- 47 filtered at 200 Hz. Low Pass

Gate #6 @ down position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 290 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees,

Gates down during test. none

STATISTICS						ENGINEERING UNITS	TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN		
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-94.804	-50.939	18.489	24.576	56.558	Lbs.	LOAD PIN 3X
2	-105.661	30.799	165.295	46.885	56.096	Lbs.	LOAD PIN 3Y
3	-126.878	-46.678	40.046	41.610	62.532	Lbs.	LOAD PIN 4X
4	-169.051	37.878	215.441	83.796	91.959	Lbs.	LOAD PIN 4Y
5	-35.631	3.992	29.033	7.710	8.682	Lbs.	LOAD PIN 5X
6	-80.345	44.233	156.990	57.280	72.371	Lbs.	LOAD PIN 5Y
7	-128.657	-74.346	31.741	39.015	83.961	Lbs.	LOAD PIN 6X
8	-136.226	30.345	158.384	70.436	76.695	Lbs.	LOAD PIN 6Y
9	-586.323	-31.580	99.001	113.669	117.974	Lbs.	LOAD PIN 1
10	-243.874	-47.796	89.973	39.612	62.077	LBS.	STRAIN GAGE S1
11	-159.081	-37.797	120.147	55.678	67.295	LBS.	STRAIN GAGE S2
12	-7.147	-1.225	7.802	2.540	2.820	MICRO-IN.	STRAIN S3
13	-42.915	-8.439	20.548	11.965	14.642	MICRO-IN.	STRAIN S4A
14	-8.861	0.468	6.367	3.109	3.144	MICRO-IN.	STRAIN S4B
15	-45.389	-6.499	24.906	13.658	15.125	MICRO-IN.	STRAIN S5A
16	-7.120	2.249	9.043	3.202	3.913	MICRO-IN.	STRAIN S5B
17	-27.928	-12.364	17.656	10.171	16.010	MICRO-IN.	STRAIN S6A
18	-8.503	2.067	6.739	3.008	3.650	MICRO-IN.	STRAIN S6B
19	-8.495	4.333	29.920	8.800	9.809	MICRO-IN.	STRAIN S7A
20	-7.811	1.685	6.434	2.726	3.205	MICRO-IN.	STRAIN S7B
21	-47.505	265.394	510.572	179.355	320.316	Lbs.	WINCH CABLE LOAD
22	-0.808	-0.041	1.215	0.052	0.066	g.	TOP RIGHT ACC. A1
23	-0.888	-0.052	0.672	0.058	0.078	g.	TOP LEFT ACC. A2
26	-1.066	-0.047	1.083	0.065	0.080	g.	BOTTOM RIGHT ACC. A5
27	-1.012	-0.040	0.966	0.055	0.068	g.	BOTTOM LEFT ACC. A6
31	-0.580	34.181	68.694	24.864	42.268	Degrees	HORSE TILT-METER T1
32	-33.147	-21.030	0.414	10.628	23.563	Degrees	GATE TILT-METER T2
33	299.204	300.237	301.578	0.237	300.237	Ft. WATER	U/S POOL
34	288.809	290.143	291.886	0.354	290.143	Ft. WATER	D/S POOL
40	-0.586	-0.317	0.115	0.153	0.351	Volts	P3X
41	-0.637	0.188	1.028	0.286	0.342	Volts	P3Y
42	-0.249	0.287	0.813	0.256	0.385	Volts	P4X
43	-1.062	0.235	1.335	0.520	0.571	Volts	P4Y
44	-0.161	-0.023	0.195	0.043	0.048	Volts	P5X
45	-0.371	0.204	0.728	0.264	0.334	Volts	P5Y
46	-0.730	-0.429	0.183	0.225	0.485	Volts	P6X
47	-2.012	-1.245	0.049	0.469	1.330	Volts	P6Y
48	-62.978	-45.054	-28.354	9.860	46.121	Degrees	Winch cable angle

Information File Name: **wicketus41c.inf**

Sample Rate: 500.000 samples/sec/channel

Length of Time Recorded: 00:00:30.00

Data Collected on 3/2/01 2:13:59 PM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST wicketus41c 03/02/01

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1-33 and 40- 47 filtered at 200 Hz. Low Pass

Gate #6 @ down position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 290 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees,

Gates down during test. none

CHAN NUM				STATISTICS		ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION	SQUARE		
1	-104.639	-49.600	22.816	25.497	55.769	Lbs.	LOAD PIN 3X
2	-94.454	28.666	196.913	43.802	52.349	Lbs.	LOAD PIN 3Y
3	-123.706	-48.053	38.460	45.068	65.880	Lbs.	LOAD PIN 4X
4	-151.752	41.672	198.536	78.109	88.530	Lbs.	LOAD PIN 4Y
5	-27.273	1.647	31.672	7.867	8.037	Lbs.	LOAD PIN 5X
6	-68.188	40.396	142.718	45.648	60.955	Lbs.	LOAD PIN 5Y
7	-123.578	-71.196	37.243	40.343	81.832	Lbs.	LOAD PIN 6X
8	-148.536	30.476	172.335	73.359	79.438	Lbs.	LOAD PIN 6Y
9	-580.272	-28.634	107.322	108.153	111.880	Lbs.	LOAD PIN 1
10	-414.203	-42.896	53.961	31.634	53.299	LBS.	STRAIN GAGE S1
11	-171.908	-39.654	118.174	57.627	69.952	LBS.	STRAIN GAGE S2
12	-6.557	-1.116	5.257	2.157	2.428	MICRO-IN.	STRAIN S3
13	-45.181	-8.258	21.433	11.330	14.020	MICRO-IN.	STRAIN S4A
14	-10.237	0.408	14.945	2.895	2.924	MICRO-IN.	STRAIN S4B
15	-45.058	-7.047	25.623	14.417	16.047	MICRO-IN.	STRAIN S5A
16	-8.159	2.362	8.953	3.417	4.154	MICRO-IN.	STRAIN S5B
17	-27.652	-12.747	15.669	9.762	16.056	MICRO-IN.	STRAIN S6A
18	-10.363	1.992	6.920	2.799	3.436	MICRO-IN.	STRAIN S6B
19	-9.661	3.975	29.476	8.402	9.295	MICRO-IN.	STRAIN S7A
20	-9.291	1.758	6.619	2.771	3.282	MICRO-IN.	STRAIN S7B
21	-39.543	257.250	506.953	178.323	313.012	Lbs.	WINCH CABLE LOAD
22	-0.822	-0.041	1.420	0.053	0.067	g.	TOP RIGHT ACC. A1
23	-1.094	-0.049	0.692	0.058	0.076	g.	TOP LEFT ACC. A2
26	-0.928	-0.046	0.963	0.068	0.082	g.	BOTTOM RIGHT ACC. A5
27	-1.035	-0.040	0.715	0.054	0.067	g.	BOTTOM LEFT ACC. A6
31	-0.604	33.916	68.986	25.013	42.142	Degrees	HORSE TILT-METER T1
32	-33.147	-21.027	0.463	10.885	23.678	Degrees	GATE TILT-METER T2
33	299.124	300.396	301.465	0.223	300.396	Ft. WATER	U/S POOL
34	288.539	290.159	291.688	0.336	290.159	Ft. WATER	D/S POOL
40	-0.640	-0.308	0.134	0.158	0.346	Volts	P3X
41	-0.571	0.175	1.174	0.267	0.319	Volts	P3Y
42	-0.234	0.296	0.762	0.278	0.406	Volts	P4X
43	-0.945	0.259	1.238	0.485	0.550	Volts	P4Y
44	-0.186	-0.009	0.134	0.044	0.045	Volts	P5X
45	-0.315	0.187	0.635	0.211	0.282	Volts	P5Y
46	-0.720	-0.411	0.212	0.233	0.472	Volts	P6X
47	-1.997	-1.237	0.029	0.486	1.329	Volts	P6Y
48	-62.904	-45.381	-31.215	9.606	46.386	Degrees	Winch cable angle

Information File Name: **wicketus15a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 8/3/00 8:38:34 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #15a Series 3a Condition B 8/3/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 & 49 filtered at 200 Hz. Low Pass

Gate #6 @ down position, and raise gate to 65 degrees horse.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 285 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from down position to 65 degrees horse, gates none down during test. In bottom lift mode.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN	ENGINEERING UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-126.668	-78.221	-3.540	38.397	87.137	Lbs.	LOAD PIN 3X
2	-93.254	50.349	204.118	73.452	89.051	Lbs.	LOAD PIN 3Y
3	-145.909	-33.414	79.695	73.093	80.368	Lbs.	LOAD PIN 4X
4	-155.684	109.408	259.866	98.372	147.130	Lbs.	LOAD PIN 4Y
5	-31.232	-7.485	9.238	5.854	9.502	Lbs.	LOAD PIN 5X
6	-104.660	82.902	261.121	91.659	123.589	Lbs.	LOAD PIN 5Y
7	-140.083	-97.287	2.962	42.916	106.332	Lbs.	LOAD PIN 6X
8	-82.885	114.704	269.170	91.254	146.575	Lbs.	LOAD PIN 6Y
9	-12.200	24.126	79.695	12.125	27.002	Lbs.	LOAD PIN 1
10	28.491	160.326	289.505	67.501	173.956	LBS.	STRAIN GAGE S1
11	-191.690	-87.394	58.872	61.339	106.772	LBS.	STRAIN GAGE S2
12	-6.023	-0.939	5.267	2.432	2.608	MICRO-IN.	STRAIN S3
13	-11.291	7.540	37.207	12.698	14.768	MICRO-IN.	STRAIN S4A
14	-8.179	0.410	11.884	3.990	4.011	MICRO-IN.	STRAIN S4B
15	-17.777	6.222	37.476	16.266	17.416	MICRO-IN.	STRAIN S5A
16	-8.062	1.376	6.158	4.404	4.614	MICRO-IN.	STRAIN S5B
17	-21.239	-7.404	24.921	13.816	15.675	MICRO-IN.	STRAIN S6A
18	-5.993	3.377	7.325	3.532	4.887	MICRO-IN.	STRAIN S6B
19	-14.055	-1.949	25.707	11.453	11.618	MICRO-IN.	STRAIN S7A
20	-7.389	2.028	5.838	3.318	3.889	MICRO-IN.	STRAIN S7B
21	-0.803	469.973	784.306	205.449	512.917	Lbs.	WINCH CABLE LOAD
22	-0.338	-0.057	0.331	0.033	0.066	g.	TOP RIGHT ACC. A1
23	-0.345	-0.047	0.143	0.041	0.063	g.	TOP LEFT ACC. A2
24	-0.147	-0.053	0.801	0.087	0.102	g.	MID. RIGHT ACC. A3
25	-0.489	-0.059	0.701	0.153	0.164	g.	MID. LEFT ACC. A4
26	-0.278	-0.054	0.266	0.052	0.075	g.	BOTTOM RIGHT ACC. A5
27	-0.380	-0.057	0.211	0.035	0.067	g.	BOTTOM LEFT ACC. A6
28	-0.234	-0.034	0.225	0.032	0.046	g.	HORSE ACC. A7X
29	-0.188	-0.032	0.165	0.024	0.040	g.	HORSE ACC. A7Y
30	-0.465	-0.042	0.416	0.058	0.072	g.	HORSE ACC. A7Z
31	-0.095	29.973	66.557	22.056	37.213	Degrees	HORSE TILT-METER T1
32	-31.855	-19.369	0.080	9.194	21.441	Degrees	GATE TILT-METER T2
33	299.775	299.995	300.271	0.088	299.995	Ft. WATER	U/S POOL
34	284.630	285.085	285.408	0.188	285.085	Ft. WATER	D/S POOL
35	-1.657	41.760	367.281	11.927	43.430	Lbs.	BUMPER PLATE R. SHEA
36	12.994	28.186	46.368	5.890	28.795	Lbs.	BUMPER PLATE L. SHEA
37	-6.265	13.833	88.048	19.061	23.551	Lbs.	BUMPER PLATE R. MOME
38	1.298	32.002	179.463	36.926	48.864	Lbs.	BUMPER PLATE L. MOME
39	-0.092	-0.072	-0.054	0.002	0.072	IN. VEL.	LASER VELOCITY @ 10
40	-0.784	-0.486	-0.020	0.238	0.541	Volts	P3X
41	-0.571	0.307	1.248	0.448	0.543	Volts	P3Y
42	-0.488	0.206	0.896	0.450	0.495	Volts	P4X
43	-0.964	0.680	1.611	0.611	0.914	Volts	P4Y
44	-0.054	0.041	0.173	0.033	0.053	Volts	P5X
45	-0.486	0.383	1.204	0.423	0.571	Volts	P5Y
46	-0.806	-0.561	0.017	0.248	0.613	Volts	P6X
47	-0.493	0.683	1.609	0.543	0.873	Volts	P6Y
48	-62.098	-35.383	-17.650	14.207	38.129	Degrees	Winch cable angle
49	-0.061	-0.052	-0.044	0.001	0.052	mm	Laser displacement

Information File Name: **wicketus15b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 8/3/00 8:42:23 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #15b Series 3a Condition B 8/3/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 & 49 filtered at 200 Hz. Low Pass

Gate #6 @ down position, and raise gate to 65 degrees horse.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 285 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from down position to 65 degrees horse, gates none down during test. In bottom lift mode.

CHAN NUM	STATISTICS					ENGINEERING UNITS	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION	ROOT MEAN SQUARE		
1	-128.635	-80.265	2.360	37.121	88.433	Lbs.	LOAD PIN 3X
2	-96.456	49.046	194.112	69.390	84.973	Lbs.	LOAD PIN 3Y
3	-137.187	-38.724	89.607	70.895	80.781	Lbs.	LOAD PIN 4X
4	-177.307	93.348	279.916	95.124	133.276	Lbs.	LOAD PIN 4Y
5	-32.552	-4.302	11.437	7.032	8.243	Lbs.	LOAD PIN 5X
6	-111.532	80.117	238.392	86.591	117.969	Lbs.	LOAD PIN 5Y
7	-151.933	-108.145	5.502	42.426	116.169	Lbs.	LOAD PIN 6X
8	-91.091	110.156	275.735	92.663	143.948	Lbs.	LOAD PIN 6Y
9	-29.704	24.974	70.068	11.203	27.372	Lbs.	LOAD PIN 1
10	36.522	160.261	293.520	64.249	172.660	LBS.	STRAIN GAGE S1
11	-189.717	-80.019	78.601	61.012	100.626	LBS.	STRAIN GAGE S2
12	-5.567	-0.685	5.176	2.323	2.422	MICRO-IN.	STRAIN S3
13	-12.021	5.675	32.193	11.369	12.707	MICRO-IN.	STRAIN S4A
14	-6.977	0.726	5.227	3.619	3.691	MICRO-IN.	STRAIN S4B
15	-17.149	4.294	38.731	16.014	16.580	MICRO-IN.	STRAIN S5A
16	-7.337	1.845	6.611	4.202	4.589	MICRO-IN.	STRAIN S5B
17	-20.696	-8.793	25.102	13.011	15.704	MICRO-IN.	STRAIN S6A
18	-4.544	3.843	7.325	3.180	4.988	MICRO-IN.	STRAIN S6B
19	-13.785	-3.054	21.847	10.202	10.649	MICRO-IN.	STRAIN S7A
20	-6.302	2.204	5.748	3.124	3.823	MICRO-IN.	STRAIN S7B
21	15.691	467.217	767.812	186.451	503.047	Lbs.	WINCH CABLE LOAD
22	-0.460	-0.057	0.399	0.036	0.067	g.	TOP RIGHT ACC. A1
23	-0.345	-0.058	0.122	0.035	0.068	g.	TOP LEFT ACC. A2
24	-0.492	-0.094	0.779	0.113	0.148	g.	MID. RIGHT ACC. A3
25	-0.445	-0.059	0.701	0.145	0.157	g.	MID. LEFT ACC. A4
26	-0.208	-0.061	0.209	0.033	0.069	g.	BOTTOM RIGHT ACC. A5
27	-0.479	-0.057	0.461	0.038	0.069	g.	BOTTOM LEFT ACC. A6
28	-0.347	-0.034	0.317	0.035	0.049	g.	HORSE ACC. A7X
29	-0.223	-0.034	0.211	0.027	0.044	g.	HORSE ACC. A7Y
30	-0.309	-0.042	0.230	0.056	0.070	g.	HORSE ACC. A7Z
31	-0.144	33.063	66.312	23.317	40.458	Degrees	HORSE TILT-METER T1
32	-29.493	-20.149	0.130	8.536	21.883	Degrees	GATE TILT-METER T2
33	299.598	299.897	300.159	0.114	299.897	Ft. WATER	U/S POOL
34	284.232	285.030	285.354	0.239	285.030	Ft. WATER	D/S POOL
35	0.552	47.924	75.665	10.280	49.014	Lbs.	BUMPER PLATE R. SHEA
36	10.769	29.042	46.368	6.539	29.769	Lbs.	BUMPER PLATE L. SHEA
37	-13.002	11.819	88.048	15.256	19.299	Lbs.	BUMPER PLATE R. MOME
38	1.298	30.464	177.263	29.432	42.359	Lbs.	BUMPER PLATE L. MOME
39	-0.092	-0.072	-0.062	0.002	0.072	IN. VEL.	LASER VELOCITY @ 10
40	-0.796	-0.498	0.012	0.230	0.549	Volts	P3X
41	-0.586	0.299	1.184	0.423	0.518	Volts	P3Y
42	-0.552	0.238	0.840	0.437	0.498	Volts	P4X
43	-1.101	0.580	1.741	0.591	0.828	Volts	P4Y
44	-0.066	0.024	0.181	0.039	0.046	Volts	P5X
45	-0.515	0.370	1.099	0.400	0.545	Volts	P5Y
46	-0.879	-0.624	0.029	0.245	0.670	Volts	P6X
47	-0.544	0.656	1.643	0.552	0.857	Volts	P6Y
48	-61.206	-34.390	-19.093	13.369	36.897	Degrees	Winch cable angle
49	-0.059	-0.052	-0.044	0.001	0.052	mm	Laser displacement

Information File Name: **wicketus15c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 8/3/00 8:44:16 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #15c Series 3a Condition B 8/3/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 & 49 filtered at 200 Hz. Low Pass

Gate #6 @ down position, and raise gate to 65 degrees horse.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 285 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from down position to 65 degrees horse, gates none down during test. In bottom lift mode.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN	ENGINEERING UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-119.980	-77.119	1.574	35.315	84.820	Lbs.	LOAD PIN 3X
2	-83.248	46.937	189.709	65.947	80.945	Lbs.	LOAD PIN 3Y
3	-148.685	-37.957	81.281	72.214	81.582	Lbs.	LOAD PIN 4X
4	-185.169	103.516	298.001	108.681	150.091	Lbs.	LOAD PIN 4Y
5	-33.872	-8.437	10.997	7.045	10.992	Lbs.	LOAD PIN 5X
6	-128.446	79.495	238.392	94.755	123.685	Lbs.	LOAD PIN 5Y
7	-147.701	-104.653	-5.502	39.047	111.700	Lbs.	LOAD PIN 6X
8	-80.423	119.093	291.738	96.363	153.195	Lbs.	LOAD PIN 6Y
9	-13.951	24.450	83.195	12.663	27.534	Lbs.	LOAD PIN 1
10	52.584	166.164	305.567	64.357	178.192	LBS.	STRAIN GAGE S1
11	-219.310	-85.583	70.710	66.049	108.106	LBS.	STRAIN GAGE S2
12	-6.023	-0.797	6.724	2.921	3.028	MICRO-IN.	STRAIN S3
13	-9.286	8.747	39.304	13.719	16.270	MICRO-IN.	STRAIN S4A
14	-9.381	-0.134	4.303	4.147	4.150	MICRO-IN.	STRAIN S4B
15	-15.893	6.443	42.409	17.459	18.610	MICRO-IN.	STRAIN S5A
16	-8.424	1.514	6.248	4.523	4.770	MICRO-IN.	STRAIN S5B
17	-20.153	-7.068	29.628	14.380	16.023	MICRO-IN.	STRAIN S6A
18	-6.446	3.365	7.506	3.581	4.914	MICRO-IN.	STRAIN S6B
19	-13.067	-1.406	26.604	11.812	11.895	MICRO-IN.	STRAIN S7A
20	-7.208	2.077	5.929	3.348	3.940	MICRO-IN.	STRAIN S7B
21	5.795	491.663	826.090	206.288	533.186	Lbs.	WINCH CABLE LOAD
22	-0.688	-0.057	0.352	0.034	0.067	g.	TOP RIGHT ACC. A1
23	-0.254	-0.058	0.163	0.037	0.068	g.	TOP LEFT ACC. A2
24	-0.489	-0.095	0.770	0.123	0.155	g.	MID. RIGHT ACC. A3
25	-0.459	-0.059	0.699	0.147	0.159	g.	MID. LEFT ACC. A4
26	-0.247	-0.061	0.113	0.035	0.070	g.	BOTTOM RIGHT ACC. A5
27	-0.512	-0.058	0.329	0.034	0.067	g.	BOTTOM LEFT ACC. A6
28	-0.433	-0.035	0.371	0.041	0.054	g.	HORSE ACC. A7X
29	-0.225	-0.032	0.138	0.026	0.041	g.	HORSE ACC. A7Y
30	-0.612	-0.043	0.840	0.057	0.072	g.	HORSE ACC. A7Z
31	-0.095	31.259	62.783	22.410	38.462	Degrees	HORSE TILT-METER T1
32	-29.591	-19.951	0.130	8.859	21.829	Degrees	GATE TILT-METER T2
33	299.550	299.920	300.368	0.201	299.920	Ft. WATER	U/S POOL
34	284.504	284.961	285.408	0.242	284.961	Ft. WATER	D/S POOL
35	-1.657	49.715	69.038	11.286	50.980	Lbs.	BUMPER PLATE R. SHEA
36	15.219	29.386	55.267	6.144	30.021	Lbs.	BUMPER PLATE L. SHEA
37	-15.247	12.557	90.294	16.452	20.696	Lbs.	BUMPER PLATE R. MOME
38	12.296	32.967	186.062	33.269	46.836	Lbs.	BUMPER PLATE L. MOME
39	-0.084	-0.072	-0.046	0.002	0.072	IN. VEL.	LASER VELOCITY @ 10
40	-0.747	-0.479	0.007	0.219	0.526	Volts	P3X
41	-0.508	0.286	1.157	0.402	0.494	Volts	P3Y
42	-0.498	0.234	0.916	0.445	0.502	Volts	P4X
43	-1.152	0.643	1.855	0.675	0.932	Volts	P4Y
44	-0.063	0.047	0.188	0.039	0.061	Volts	P5X
45	-0.596	0.367	1.101	0.438	0.571	Volts	P5Y
46	-0.837	-0.604	-0.032	0.225	0.644	Volts	P6X
47	-0.479	0.709	1.741	0.574	0.912	Volts	P6Y
48	-61.503	-34.543	-17.438	14.062	37.295	Degrees	Winch cable angle
49	-0.068	-0.052	-0.044	0.001	0.052	mm	Laser displacement



Information File Name: **wicketus42a.inf**

Sample Rate: 500.000 samples/sec/channel

Length of Time Recorded: 00:00:30.00

Data Collected on 3/2/01 2:22:01 PM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST wicketus42a 03/02/01

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1-33 and 40- 47 filtered at 200 Hz. Low Pass

Gate #6 @ down position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 285 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees,

Gates down during test. none

CHAN NUM	STATISTICS				ROOT MEAN SQUARE	ENGINEERING UNITS	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION			
1	-127.848	-72.194	4.327	34.042	79.818	Lbs.	LOAD PIN 3X
2	-40.023	77.986	245.742	71.020	105.478	Lbs.	LOAD PIN 3Y
3	-178.025	-42.534	58.681	57.559	71.570	Lbs.	LOAD PIN 4X
4	-250.824	76.313	256.328	101.261	126.797	Lbs.	LOAD PIN 4Y
5	-34.312	4.503	38.711	9.672	10.669	Lbs.	LOAD PIN 5X
6	-174.962	94.081	271.693	97.413	135.427	Lbs.	LOAD PIN 5Y
7	-150.240	-89.422	5.925	37.421	96.936	Lbs.	LOAD PIN 6X
8	-222.804	86.670	264.246	103.911	135.312	Lbs.	LOAD PIN 6Y
9	-363.933	-24.901	102.784	119.807	122.368	Lbs.	LOAD PIN 1
10	-419.070	-84.390	35.468	64.133	105.994	LBS.	STRAIN GAGE S1
11	-209.401	-74.126	186.254	68.510	100.937	LBS.	STRAIN GAGE S2
12	-6.284	-0.622	8.892	2.247	2.331	MICRO-IN.	STRAIN S3
13	-35.618	-3.242	30.388	15.594	15.928	MICRO-IN.	STRAIN S4A
14	-9.640	0.045	11.596	3.949	3.949	MICRO-IN.	STRAIN S4B
15	-38.277	-0.446	40.454	20.331	20.336	MICRO-IN.	STRAIN S5A
16	-9.288	1.766	8.907	4.506	4.839	MICRO-IN.	STRAIN S5B
17	-29.805	-12.664	18.704	13.722	18.673	MICRO-IN.	STRAIN S6A
18	-8.593	2.346	8.145	3.722	4.400	MICRO-IN.	STRAIN S6B
19	-11.160	3.893	34.583	11.696	12.327	MICRO-IN.	STRAIN S7A
20	-9.106	2.123	7.498	3.356	3.972	MICRO-IN.	STRAIN S7B
21	-21.447	400.739	778.392	269.420	482.886	Lbs.	WINCH CABLE LOAD
22	-3.282	-0.042	1.806	0.071	0.083	g.	TOP RIGHT ACC. A1
23	-1.219	-0.052	2.642	0.072	0.089	g.	TOP LEFT ACC. A2
26	-1.076	-0.049	2.638	0.077	0.091	g.	BOTTOM RIGHT ACC. A5
27	-3.297	-0.041	2.016	0.071	0.081	g.	BOTTOM LEFT ACC. A6
31	-0.750	32.378	66.969	24.207	40.426	Degrees	HORSE TILT-METER T1
32	-33.147	-20.201	0.657	10.215	22.637	Degrees	GATE TILT-METER T2
33	298.849	300.068	301.013	0.214	300.068	Ft. WATER	U/S POOL
34	284.059	285.423	286.470	0.273	285.423	Ft. WATER	D/S POOL
40	-0.784	-0.448	0.017	0.211	0.496	Volts	P3X
41	-0.242	0.476	1.501	0.433	0.644	Volts	P3Y
42	-0.359	0.262	1.091	0.354	0.441	Volts	P4X
43	-1.558	0.474	1.584	0.629	0.787	Volts	P4Y
44	-0.203	-0.025	0.188	0.053	0.059	Volts	P5X
45	-0.825	0.435	1.257	0.450	0.626	Volts	P5Y
46	-0.876	-0.516	0.037	0.216	0.559	Volts	P6X
47	-1.958	-1.249	0.068	0.596	1.384	Volts	P6Y
48	-62.682	-44.272	-18.490	12.018	45.874	Degrees	Winch cable angle

Information File Name: **wicketus42b.inf**

Sample Rate: 500.000 samples/sec/channel

Length of Time Recorded: 00:00:30.00

Data Collected on 3/2/01 2:27:33 PM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST wicketus42b 03/02/01

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1-33 and 40- 47 filtered at 200 Hz. Low Pass

Gate #6 @ down position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 285 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees,

Gates down during test. none

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN	ENGINEERING UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-133.749	-74.947	4.327	34.562	82.533	Lbs.	LOAD PIN 3X
2	-51.230	86.611	246.542	70.317	111.561	Lbs.	LOAD PIN 3Y
3	-142.738	-48.486	65.818	63.651	80.015	Lbs.	LOAD PIN 4X
4	-141.924	85.940	274.019	89.726	124.243	Lbs.	LOAD PIN 4Y
5	-17.596	5.333	46.629	9.132	10.575	Lbs.	LOAD PIN 5X
6	-78.231	96.925	277.508	91.091	133.011	Lbs.	LOAD PIN 5Y
7	-146.855	-95.702	-6.348	36.622	102.470	Lbs.	LOAD PIN 6X
8	-91.912	91.998	278.608	93.017	130.827	Lbs.	LOAD PIN 6Y
9	-997.820	-16.581	122.451	100.590	101.947	Lbs.	LOAD PIN 1
10	-303.246	-89.169	37.414	62.063	108.642	LBS.	STRAIN GAGE S1
11	-207.428	-76.012	66.867	61.445	97.741	LBS.	STRAIN GAGE S2
12	-6.102	-0.648	5.484	2.049	2.149	MICRO-IN.	STRAIN S3
13	-67.349	-4.607	27.458	16.153	16.797	MICRO-IN.	STRAIN S4A
14	-9.228	0.520	11.917	4.077	4.110	MICRO-IN.	STRAIN S4B
15	-66.891	-2.201	39.075	20.133	20.253	MICRO-IN.	STRAIN S5A
16	-8.791	2.200	13.332	4.444	4.958	MICRO-IN.	STRAIN S5B
17	-39.904	-14.293	17.987	13.347	19.556	MICRO-IN.	STRAIN S6A
18	-7.550	2.839	9.914	3.633	4.611	MICRO-IN.	STRAIN S6B
19	-18.432	2.202	32.418	10.859	11.080	MICRO-IN.	STRAIN S7A
20	-7.811	2.420	9.116	3.267	4.066	MICRO-IN.	STRAIN S7B
21	-14.933	396.762	766.810	253.279	470.712	Lbs.	WINCH CABLE LOAD
22	-2.264	-0.043	2.619	0.077	0.088	g.	TOP RIGHT ACC. A1
23	-1.587	-0.056	1.414	0.065	0.086	g.	TOP LEFT ACC. A2
26	-1.776	-0.051	2.164	0.074	0.090	g.	BOTTOM RIGHT ACC. A5
27	-1.655	-0.042	1.950	0.070	0.082	g.	BOTTOM LEFT ACC. A6
31	-0.507	33.462	68.135	24.301	41.355	Degrees	HORSE TILT-METER T1
32	-33.147	-20.555	0.463	10.070	22.889	Degrees	GATE TILT-METER T2
33	298.897	300.146	301.126	0.215	300.147	Ft. WATER	U/S POOL
34	284.455	285.440	286.938	0.324	285.441	Ft. WATER	D/S POOL
40	-0.840	-0.465	0.017	0.215	0.512	Volts	P3X
41	-0.310	0.528	1.497	0.429	0.681	Volts	P3Y
42	-0.427	0.299	0.867	0.392	0.493	Volts	P4X
43	-0.889	0.534	1.682	0.557	0.772	Volts	P4Y
44	-0.242	-0.030	0.098	0.051	0.059	Volts	P5X
45	-0.356	0.448	1.292	0.421	0.614	Volts	P5Y
46	-0.823	-0.552	-0.032	0.211	0.591	Volts	P6X
47	-2.439	-1.336	-0.085	0.591	1.461	Volts	P6Y
48	-62.608	-44.771	-27.442	10.323	45.945	Degrees	Winch cable angle

Information File Name: **wicketus42c.inf**

Sample Rate: 500.000 samples/sec/channel

Length of Time Recorded: 00:00:30.00

Data Collected on 3/2/01 2:30:43 PM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST wicketus42c 03/02/01

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1-33 and 40- 47 filtered at 200 Hz. Low Pass

Gate #6 @ down position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 285 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees,

Gates down during test. none

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING	UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-132.962	-75.861	1.967	35.087	83.582	Lbs.	LOAD PIN 3X
2	-41.224	88.393	250.144	70.763	113.228	Lbs.	LOAD PIN 3Y
3	-151.460	-48.427	68.990	62.435	79.015	Lbs.	LOAD PIN 4X
4	-150.180	90.061	265.763	98.607	133.546	Lbs.	LOAD PIN 4Y
5	-21.115	2.917	41.790	8.959	9.422	Lbs.	LOAD PIN 5X
6	-68.716	103.919	285.436	97.349	142.394	Lbs.	LOAD PIN 5Y
7	-144.739	-93.027	-4.655	36.142	99.801	Lbs.	LOAD PIN 6X
8	-80.833	99.634	281.890	101.057	141.914	Lbs.	LOAD PIN 6Y
9	-620.362	-18.574	105.809	104.063	105.708	Lbs.	LOAD PIN 1
10	-484.282	-91.328	31.574	64.635	111.886	LBS.	STRAIN GAGE S1
11	-213.348	-80.132	72.787	67.518	104.785	LBS.	STRAIN GAGE S2
12	-6.693	-0.907	5.393	2.158	2.341	MICRO-IN.	STRAIN S3
13	-46.785	-3.742	32.268	17.059	17.465	MICRO-IN.	STRAIN S4A
14	-9.778	0.378	18.889	4.237	4.254	MICRO-IN.	STRAIN S4B
15	-46.712	-1.730	38.965	20.761	20.833	MICRO-IN.	STRAIN S5A
16	-8.655	2.167	10.488	4.556	5.046	MICRO-IN.	STRAIN S5B
17	-34.661	-14.088	19.146	13.461	19.485	MICRO-IN.	STRAIN S6A
18	-8.730	2.710	9.325	3.767	4.640	MICRO-IN.	STRAIN S6B
19	-13.769	2.401	31.641	11.548	11.795	MICRO-IN.	STRAIN S7A
20	-7.441	2.528	8.423	3.273	4.135	MICRO-IN.	STRAIN S7B
21	-15.657	412.685	801.555	267.247	491.660	Lbs.	WINCH CABLE LOAD
22	-1.340	-0.042	1.751	0.060	0.074	g.	TOP RIGHT ACC. A1
23	-1.065	-0.056	0.845	0.056	0.079	g.	TOP LEFT ACC. A2
26	-1.212	-0.051	1.393	0.064	0.082	g.	BOTTOM RIGHT ACC. A5
27	-1.461	-0.042	1.224	0.058	0.071	g.	BOTTOM LEFT ACC. A6
31	-0.556	33.477	67.722	24.280	41.355	Degrees	HORSE TILT-METER T1
32	-33.147	-20.526	0.463	9.988	22.827	Degrees	GATE TILT-METER T2
33	298.962	300.077	301.158	0.220	300.077	Ft. WATER	U/S POOL
34	284.077	285.386	286.488	0.299	285.387	Ft. WATER	D/S POOL
40	-0.852	-0.471	0.010	0.218	0.519	Volts	P3X
41	-0.244	0.539	1.516	0.432	0.691	Volts	P3Y
42	-0.422	0.298	0.925	0.384	0.487	Volts	P4X
43	-0.920	0.559	1.650	0.612	0.829	Volts	P4Y
44	-0.229	-0.016	0.115	0.050	0.052	Volts	P5X
45	-0.325	0.480	1.328	0.450	0.658	Volts	P5Y
46	-0.840	-0.537	-0.022	0.208	0.576	Volts	P6X
47	-2.205	-1.309	-0.029	0.608	1.443	Volts	P6Y
48	-63.027	-44.588	-25.888	10.680	45.850	Degrees	Winch cable angle

Information File Name: **wicketus28a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:40.00

Data Collected on 8/8/00 10:04:13 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #28a Series 3b Condition A 8/8/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1-30 & 33-47 filtered at 200 Hz. Low Pass

Gate #6 @ raised, locked position & winch cable attached to bottom of gage.

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, gates open #7 & 8 , release gate #6 for bumper plate test from raised position.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS		
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-75.529	-34.571	100.705	13.000	36.934 Lbs.	LOAD PIN 3X	
2	-523.902	-8.704	257.348	22.297	23.936 Lbs.	LOAD PIN 3Y	
3	-478.171	26.677	92.383	11.225	28.943 Lbs.	LOAD PIN 4X	
4	-805.153	-5.799	647.897	26.683	27.306 Lbs.	LOAD PIN 4Y	
5	-28.593	41.516	186.955	4.100	41.718 Lbs.	LOAD PIN 5X	
6	-766.978	-27.397	218.306	27.716	38.971 Lbs.	LOAD PIN 5Y	
7	-83.373	-41.678	173.094	8.475	42.531 Lbs.	LOAD PIN 6X	
8	-840.336	5.686	408.269	24.704	25.350 Lbs.	LOAD PIN 6Y	
9	-1775.031	-327.563	122.069	95.797	341.284 Lbs.	LOAD PIN 1	
10	-201.169	3.631	441.046	15.185	15.613 LBS.	STRAIN GAGE S1	
11	-476.270	17.095	1405.899	20.972	27.056 LBS.	STRAIN GAGE S2	
12	-17.580	2.107	39.380	1.408	2.534 MICRO-IN.	STRAIN S3	
13	-184.211	-2.699	188.461	7.934	8.380 MICRO-IN.	STRAIN S4A	
14	-87.935	2.554	57.549	1.850	3.154 MICRO-IN.	STRAIN S4B	
15	-182.442	-2.054	187.743	10.138	10.344 MICRO-IN.	STRAIN S5A	
16	-89.362	3.397	51.903	1.500	3.714 MICRO-IN.	STRAIN S5B	
17	-140.920	-14.387	188.100	4.018	14.938 MICRO-IN.	STRAIN S6A	
18	-38.674	3.982	50.273	1.026	4.112 MICRO-IN.	STRAIN S6B	
19	-147.238	-4.915	187.821	3.679	6.139 MICRO-IN.	STRAIN S7A	
20	-43.086	3.602	39.632	1.016	3.743 MICRO-IN.	STRAIN S7B	
21	-64.280	-58.246	-49.939	0.862	58.252 Lbs.	WINCH CABLE LOAD	
22	-9.570	-0.119	9.527	0.484	0.498 g.	TOP RIGHT ACC. A1	
23	-9.824	-0.081	9.780	0.384	0.392 g.	TOP LEFT ACC. A2	
26	-5.334	-0.046	5.268	0.211	0.216 g.	BOTTOM RIGHT ACC. A5	
27	-4.941	-0.058	4.899	0.240	0.247 g.	BOTTOM LEFT ACC. A6	
28	-3.273	-0.036	3.232	0.078	0.086 g.	HORSE ACC. A7X	
29	-2.007	-0.036	2.437	0.053	0.065 g.	HORSE ACC. A7Y	
30	-3.261	-0.044	3.064	0.107	0.116 g.	HORSE ACC. A7Z	
31	62.881	65.249	66.802	0.101	65.249 Degrees	HORSE TILT-METER T1	
32	-21.521	50.453	65.328	30.632	59.024 Degrees	GATE TILT-METER T2	
33	298.301	298.796	299.166	0.287	298.796 Ft. WATER	U/S POOL	
34	293.550	294.345	295.196	0.519	294.345 Ft. WATER	D/S POOL	
35	-385.985	-197.038	2877.361	113.145	227.213 Lbs.	BUMPER PLATE R. SHEA	
36	-689.781	-407.723	4274.309	218.904	462.771 Lbs.	BUMPER PLATE L. SHEA	
37	-8.787	796.879	4640.145	400.950	892.063 Lbs.	BUMPER PLATE R. MOME	
38	-3.682	2152.794	4577.831	1075.052	2406.296 Lbs.	BUMPER PLATE L. MOME	
40	-0.503	-0.215	0.901	0.081	0.229 Volts	P3X	
41	-3.501	-0.053	1.479	0.136	0.146 Volts	P3Y	
42	-0.544	-0.164	3.013	0.069	0.178 Volts	P4X	
43	-5.000	-0.036	3.474	0.166	0.170 Volts	P4Y	
44	-1.208	-0.231	0.100	0.023	0.232 Volts	P5X	
45	-3.730	-0.083	1.401	0.124	0.150 Volts	P5Y	
46	-0.410	-0.240	1.086	0.049	0.245 Volts	P6X	
47	-5.000	0.034	2.258	0.146	0.150 Volts	P6Y	
48	54.434	54.434	54.434	0.000	54.434 Degrees	Winch cable angle	

Information File Name: **wicketus28b.inf**

Sample Rate: 500.000 samples/sec/channel

Length of Time Recorded: 00:00:25.00

Data Collected on 8/8/00 1:04:05 PM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #28b Series 3b Condition A 8/8/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1-30 & 33-47 filtered at 200 Hz. Low Pass

Gate #6 @ raised, locked position & winch cable attached to bottom of gage.

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, gates open #7 & 8 , release gate #6 for bumper plate test from raised position.

STATISTICS						ENGINEERING UNITS	TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN		
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-78.660	-43.919	176.985	13.301	45.889	Lbs.	LOAD PIN 3X
2	-502.690	20.584	432.249	30.826	37.067	Lbs.	LOAD PIN 3Y
3	-486.894	8.602	119.741	22.466	24.056	Lbs.	LOAD PIN 4X
4	-1548.190	3.725	743.823	40.666	40.836	Lbs.	LOAD PIN 4Y
5	-37.831	35.557	135.487	4.713	35.868	Lbs.	LOAD PIN 5X
6	-935.344	-5.323	394.218	36.829	37.212	Lbs.	LOAD PIN 5Y
7	-106.626	-47.882	196.328	14.314	49.975	Lbs.	LOAD PIN 6X
8	-840.336	-3.970	341.797	26.825	27.117	Lbs.	LOAD PIN 6Y
9	-3556.697	-269.421	167.731	107.736	290.163	Lbs.	LOAD PIN 1
10	-377.711	-23.043	470.332	21.960	31.831	LBS.	STRAIN GAGE S1
11	-607.615	1.649	1219.089	29.813	29.859	LBS.	STRAIN GAGE S2
12	-16.637	0.981	35.250	1.632	1.904	MICRO-IN.	STRAIN S3
13	-247.613	-5.460	617.888	12.777	13.895	MICRO-IN.	STRAIN S4A
14	-115.700	3.537	80.198	2.401	4.274	MICRO-IN.	STRAIN S4B
15	-238.369	-11.523	376.159	12.890	17.290	MICRO-IN.	STRAIN S5A
16	-136.384	4.554	65.998	2.353	5.126	MICRO-IN.	STRAIN S5B
17	-169.104	-11.163	184.465	4.683	12.106	MICRO-IN.	STRAIN S6A
18	-40.807	3.811	49.463	1.285	4.021	MICRO-IN.	STRAIN S6B
19	-153.895	-6.969	260.557	4.900	8.519	MICRO-IN.	STRAIN S7A
20	-55.369	3.722	43.784	1.296	3.942	MICRO-IN.	STRAIN S7B
21	-25.906	-18.433	-7.189	0.880	18.453	Lbs.	WINCH CABLE LOAD
22	-9.653	-0.129	9.610	0.446	0.465	g.	TOP RIGHT ACC. A1
23	-9.921	-0.124	9.876	0.402	0.420	g.	TOP LEFT ACC. A2
26	-11.007	-0.096	10.870	0.469	0.479	g.	BOTTOM RIGHT ACC. A5
27	-10.080	-0.143	9.995	0.501	0.521	g.	BOTTOM LEFT ACC. A6
28	-5.554	-0.099	6.588	0.120	0.156	g.	HORSE ACC. A7X
29	-3.988	-0.072	4.099	0.112	0.132	g.	HORSE ACC. A7Y
30	-3.802	-0.088	5.771	0.157	0.180	g.	HORSE ACC. A7Z
31	62.195	65.278	66.851	0.156	65.278	Degrees	HORSE TILT-METER T1
32	-22.260	36.898	65.525	34.234	50.333	Degrees	GATE TILT-METER T2
33	298.557	298.869	299.486	0.294	298.869	Ft. WATER	U/S POOL
34	294.110	294.666	295.105	0.313	294.666	Ft. WATER	D/S POOL
35	8.046	194.936	4942.122	162.874	254.024	Lbs.	BUMPER PLATE R. SHEA
36	-7.170	210.749	6232.833	202.762	292.451	Lbs.	BUMPER PLATE L. SHEA
37	-8.570	265.052	6349.413	249.042	363.695	Lbs.	BUMPER PLATE R. MOME
38	-35.710	310.184	5858.340	295.597	428.476	Lbs.	BUMPER PLATE L. MOME
40	-0.237	-0.136	0.471	0.041	0.142	Volts	P3X
41	-1.616	0.063	1.436	0.094	0.113	Volts	P3Y
42	-0.400	-0.026	1.445	0.069	0.074	Volts	P4X
43	-4.861	0.012	2.258	0.126	0.126	Volts	P4Y
44	-0.417	-0.099	0.056	0.013	0.100	Volts	P5X
45	-2.205	0.029	1.018	0.082	0.087	Volts	P5Y
46	-0.266	-0.138	0.562	0.041	0.144	Volts	P6X
47	-5.000	-0.024	1.965	0.159	0.161	Volts	P6Y
48	54.434	54.434	54.434	0.000	54.434	Degrees	Winch cable angle

Information File Name: **wicketus28c.inf**

Sample Rate: 1000.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/9/00 8:48:13 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #28c Series 3b Condition A 8/8/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1-30 & 33-47 filtered at 200 Hz. Low Pass

Gate #6 @ raised, locked position & winch cable attached to bottom of gage.

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, all gates up or closed, release gate #6 for bumper plate test from raised position.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS		
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-97.538	-42.188	179.345	13.254	44.221 Lbs.	LOAD PIN 3X	
2	-906.122	0.390	303.375	32.364	32.367 Lbs.	LOAD PIN 3Y	
3	-489.272	1.140	139.566	28.752	28.774 Lbs.	LOAD PIN 4X	
4	-1610.306	7.853	592.857	44.932	45.613 Lbs.	LOAD PIN 4Y	
5	-52.787	38.824	177.717	5.686	39.238 Lbs.	LOAD PIN 5X	
6	-1426.796	-3.769	366.739	44.189	44.350 Lbs.	LOAD PIN 5Y	
7	-121.859	-43.514	209.868	16.529	46.548 Lbs.	LOAD PIN 6X	
8	-1609.276	-26.462	413.603	50.390	56.916 Lbs.	LOAD PIN 6Y	
9	-3541.946	-266.526	147.526	120.548	292.519 Lbs.	LOAD PIN 1	
10	-311.930	-16.315	863.391	24.833	29.713 LBS.	STRAIN GAGE S1	
11	-476.244	9.112	1346.999	31.902	33.178 LBS.	STRAIN GAGE S2	
12	-19.382	0.261	42.324	1.611	1.632 MICRO-IN.	STRAIN S3	
13	-298.318	-4.767	750.755	16.454	17.131 MICRO-IN.	STRAIN S4A	
14	-129.083	3.241	72.037	3.299	4.625 MICRO-IN.	STRAIN S4B	
15	-235.019	-11.350	746.171	16.334	19.890 MICRO-IN.	STRAIN S5A	
16	-161.186	4.510	62.196	3.058	5.449 MICRO-IN.	STRAIN S5B	
17	-170.853	-11.520	277.706	6.819	13.386 MICRO-IN.	STRAIN S6A	
18	-57.471	3.983	46.835	1.795	4.369 MICRO-IN.	STRAIN S6B	
19	-153.529	-6.237	329.645	6.829	9.248 MICRO-IN.	STRAIN S7A	
20	-68.021	3.888	40.773	1.666	4.230 MICRO-IN.	STRAIN S7B	
21	-24.231	-15.516	-6.593	1.060	15.552 Lbs.	WINCH CABLE LOAD	
22	-19.724	-0.259	19.636	0.824	0.864 g.	TOP RIGHT ACC. A1	
23	-20.242	-0.295	20.152	0.791	0.844 g.	TOP LEFT ACC. A2	
26	-23.587	-0.264	23.295	0.861	0.901 g.	BOTTOM RIGHT ACC. A5	
27	-21.004	-0.299	20.827	0.887	0.936 g.	BOTTOM LEFT ACC. A6	
28	-8.310	-0.344	12.151	0.299	0.456 g.	HORSE ACC. A7X	
29	-7.144	-0.259	7.361	0.180	0.315 g.	HORSE ACC. A7Y	
30	-14.412	-0.306	10.116	0.350	0.465 g.	HORSE ACC. A7Z	
31	61.460	65.245	66.998	0.237	65.246 Degrees	HORSE TILT-METER T1	
32	-20.094	39.228	65.427	35.010	52.579 Degrees	GATE TILT-METER T2	
33	298.236	298.502	298.974	0.194	298.502 Ft. WATER	U/S POOL	
34	294.201	294.587	294.834	0.176	294.587 Ft. WATER	D/S POOL	
35	20.344	295.623	4942.458	216.189	366.239 Lbs.	BUMPER PLATE R. SHEA	
36	-21.382	277.698	6241.307	242.047	368.379 Lbs.	BUMPER PLATE L. SHEA	
37	-37.049	258.829	6911.971	238.628	352.045 Lbs.	BUMPER PLATE R. MOME	
38	-39.747	262.823	5989.057	242.758	357.781 Lbs.	BUMPER PLATE L. MOME	
40	-0.303	-0.131	0.562	0.041	0.137 Volts	P3X	
41	-2.756	0.001	0.903	0.099	0.099 Volts	P3Y	
42	-0.396	-0.003	1.548	0.089	0.089 Volts	P4X	
43	-5.000	0.024	1.841	0.140	0.142 Volts	P4Y	
44	-0.503	-0.108	0.151	0.016	0.109 Volts	P5X	
45	-3.262	0.010	0.828	0.100	0.101 Volts	P5Y	
46	-0.349	-0.125	0.615	0.048	0.134 Volts	P6X	
47	-4.761	-0.079	1.262	0.150	0.169 Volts	P6Y	

Information File Name: **wicketus28d.inf**

Sample Rate: 1000.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/10/00 10:29:20 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #28d Series 3b Condition A 8/10/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1-30 & 33-47 filtered at 200 Hz. Low Pass

Gate #6 @ raised, locked position & winch cable attached to bottom of gage.

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, all gates up or closed, release gate #6 for bumper plate test from raised position.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN	ENGINEERING UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-109.337	-49.528	210.022	13.902	51.442	Lbs.	LOAD PIN 3X
2	-992.572	14.631	473.072	37.577	40.325	Lbs.	LOAD PIN 3Y
3	-524.164	-15.774	125.292	31.490	35.220	Lbs.	LOAD PIN 4X
4	-1754.671	7.871	724.338	47.205	47.857	Lbs.	LOAD PIN 4Y
5	-73.022	37.153	187.394	7.210	37.846	Lbs.	LOAD PIN 5X
6	-1996.822	-0.812	601.165	64.127	64.133	Lbs.	LOAD PIN 5Y
7	-128.629	-47.435	214.945	19.320	51.219	Lbs.	LOAD PIN 6X
8	-1646.205	-22.539	505.515	51.449	56.169	Lbs.	LOAD PIN 6Y
9	-4339.527	-242.194	159.203	129.333	274.563	Lbs.	LOAD PIN 1
10	-438.379	-21.806	969.877	29.450	36.645	LBS.	STRAIN GAGE S1
11	-586.989	-5.184	1335.595	33.337	33.737	LBS.	STRAIN GAGE S2
12	-23.014	-0.605	43.605	1.732	1.835	MICRO-IN.	STRAIN S3
13	-301.559	-8.478	757.130	17.083	19.071	MICRO-IN.	STRAIN S4A
14	-128.957	4.153	76.229	3.378	5.353	MICRO-IN.	STRAIN S4B
15	-251.435	-15.412	913.871	16.744	22.757	MICRO-IN.	STRAIN S5A
16	-169.161	4.462	69.277	3.133	5.452	MICRO-IN.	STRAIN S5B
17	-169.073	-11.243	257.484	6.777	13.128	MICRO-IN.	STRAIN S6A
18	-54.083	3.910	46.653	1.911	4.352	MICRO-IN.	STRAIN S6B
19	-151.321	-5.395	318.559	6.945	8.794	MICRO-IN.	STRAIN S7A
20	-63.837	3.581	41.283	1.727	3.976	MICRO-IN.	STRAIN S7B
21	-24.535	-16.450	-11.326	0.779	16.468	Lbs.	WINCH CABLE LOAD
22	-26.985	-0.682	41.022	0.994	1.206	g.	TOP RIGHT ACC. A1
23	-50.200	-0.780	26.149	1.050	1.308	g.	TOP LEFT ACC. A2
26	-17.323	-0.624	10.653	0.340	0.711	g.	BOTTOM RIGHT ACC. A5
27	-37.778	-0.744	49.975	1.202	1.413	g.	BOTTOM LEFT ACC. A6
28	-6.182	-0.327	7.454	0.163	0.365	g.	HORSE ACC. A7X
29	-3.564	-0.131	3.939	0.092	0.160	g.	HORSE ACC. A7Y
30	-6.958	-0.146	4.696	0.179	0.231	g.	HORSE ACC. A7Z
31	60.970	65.219	66.557	0.274	65.220	Degrees	HORSE TILT-METER T1
32	-21.472	23.253	65.279	36.373	43.171	Degrees	GATE TILT-METER T2
33	298.525	298.647	298.893	0.051	298.647	Ft. WATER	U/S POOL
34	294.545	294.667	294.834	0.068	294.667	Ft. WATER	D/S POOL
35	7.788	162.141	4935.576	183.048	244.532	Lbs.	BUMPER PLATE R. SHEA
36	-8.100	124.769	6211.804	188.242	225.837	Lbs.	BUMPER PLATE L. SHEA
37	-12.827	117.221	6974.871	194.146	226.789	Lbs.	BUMPER PLATE R. MOME
38	-38.115	107.369	5955.206	187.953	216.459	Lbs.	BUMPER PLATE L. MOME
40	-0.344	-0.154	0.667	0.043	0.160	Volts	P3X
41	-3.079	0.045	1.392	0.115	0.123	Volts	P3Y
42	-0.420	0.049	1.646	0.097	0.109	Volts	P4X
43	-2.837	0.013	1.213	0.078	0.079	Volts	P4Y
44	-0.527	-0.103	0.200	0.020	0.105	Volts	P5X
45	-1.760	0.013	0.562	0.059	0.060	Volts	P5Y
46	-0.352	-0.137	0.647	0.056	0.148	Volts	P6X
47	-2.422	-0.034	0.737	0.077	0.084	Volts	P6Y
49	-19.020	-1.034	41.907	1.293	1.656	MICRO-IN.	Strain Gage S1
50	-26.084	-0.291	57.771	1.466	1.494	MICRO-IN.	Strain Gage S2

Information File Name: **wicketus28e.inf**

Sample Rate: 1000.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/11/00 9:01:15 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #28e Series 3b Condition A 8/11/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1-30 & 33-47 filtered at 200 Hz. Low Pass

Gate #6 @ raised, locked position & winch cable attached to bottom of gage.

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, all gates up or closed, release gate #6 for bumper plate test from raised position.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN	ENGINEERING UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-92.819	-35.429	245.419	15.611	38.716	Lbs.	LOAD PIN 3X
2	-760.438	-27.206	235.336	31.690	41.767	Lbs.	LOAD PIN 3Y
3	-471.034	-4.081	145.116	28.033	28.328	Lbs.	LOAD PIN 4X
4	-1751.715	-2.326	736.164	41.260	41.325	Lbs.	LOAD PIN 4Y
5	-62.465	31.796	215.548	11.238	33.724	Lbs.	LOAD PIN 5X
6	-1514.830	-30.297	508.475	60.818	67.947	Lbs.	LOAD PIN 5Y
7	-121.859	-44.291	233.563	18.895	48.153	Lbs.	LOAD PIN 6X
8	-52.521	-35.239	-13.130	9.562	36.513	Lbs.	LOAD PIN 6Y
9	-3489.571	-241.479	129.742	127.507	273.076	Lbs.	LOAD PIN 1
10	-221.908	27.018	696.573	24.855	36.711	LBS.	STRAIN GAGE S1
11	-536.784	4.274	1273.865	29.695	30.001	LBS.	STRAIN GAGE S2
12	-34.512	-0.252	43.403	1.689	1.708	MICRO-IN.	STRAIN S3
13	-293.376	-4.317	693.892	17.252	17.784	MICRO-IN.	STRAIN S4A
14	-122.678	3.290	83.570	3.249	4.624	MICRO-IN.	STRAIN S4B
15	-270.127	-13.784	875.248	15.959	21.088	MICRO-IN.	STRAIN S5A
16	-162.071	4.597	78.997	2.980	5.479	MICRO-IN.	STRAIN S5B
17	-184.683	-10.283	258.404	6.300	12.060	MICRO-IN.	STRAIN S6A
18	-48.797	4.398	55.758	1.712	4.719	MICRO-IN.	STRAIN S6B
19	-169.065	-5.571	315.973	6.568	8.612	MICRO-IN.	STRAIN S7A
20	-63.767	3.778	48.568	1.665	4.129	MICRO-IN.	STRAIN S7B
21	-21.855	-9.487	-2.097	0.832	9.523	Lbs.	WINCH CABLE LOAD
22	-31.923	-0.955	49.109	1.017	1.396	g.	TOP RIGHT ACC. A1
23	-63.465	-1.112	20.409	1.003	1.497	g.	TOP LEFT ACC. A2
26	-50.626	-0.949	37.161	1.118	1.466	g.	BOTTOM RIGHT ACC. A5
27	-45.236	-1.043	69.966	1.333	1.692	g.	BOTTOM LEFT ACC. A6
28	-6.595	-0.327	8.564	0.185	0.375	g.	HORSE ACC. A7X
29	-3.388	-0.132	3.802	0.097	0.164	g.	HORSE ACC. A7Y
30	-5.960	-0.145	3.556	0.145	0.205	g.	HORSE ACC. A7Z
31	63.567	65.295	66.998	0.129	65.295	Degrees	HORSE TILT-METER T1
32	-19.996	29.406	65.378	35.604	46.177	Degrees	GATE TILT-METER T2
33	298.012	298.289	298.717	0.134	298.289	Ft. WATER	U/S POOL
34	294.038	294.729	295.087	0.274	294.729	Ft. WATER	D/S POOL
35	35.602	135.976	4694.517	109.628	174.665	Lbs.	BUMPER PLATE R. SHEA
36	-25.425	108.230	6181.484	137.915	175.312	Lbs.	BUMPER PLATE L. SHEA
37	-8.041	106.073	6462.759	152.240	185.550	Lbs.	BUMPER PLATE R. MOME
38	10.865	76.327	5665.781	118.902	141.292	Lbs.	BUMPER PLATE L. MOME
40	-0.298	-0.110	0.803	0.048	0.120	Volts	P3X
41	-1.169	-0.042	0.352	0.048	0.064	Volts	P3Y
42	-0.444	0.013	1.497	0.086	0.087	Volts	P4X
43	-2.988	-0.004	1.204	0.068	0.068	Volts	P4Y
44	-0.647	-0.088	0.164	0.031	0.094	Volts	P5X
45	-1.348	-0.014	0.491	0.056	0.057	Volts	P5Y
46	-0.337	-0.128	0.632	0.054	0.139	Volts	P6X
47	-0.085	-0.053	-0.022	0.013	0.054	Volts	P6Y
49	-9.427	1.178	30.659	1.089	1.604	MICRO-IN.	Strain Gage S1
50	-23.935	0.178	57.870	1.305	1.317	MICRO-IN.	Strain Gage S2



Information File Name: **wicketus28f.inf**

Sample Rate: 1000.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/11/00 9:35:10 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #28f Series 3b Condition A 8/11/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1-30 & 33-47 filtered at 200 Hz. Low Pass

Gate #6 @ raised, locked position & winch cable attached to bottom of gate.

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, all gates up or closed, release gate #6 for bumper plate test from raised position.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING	UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-89.672	-42.683	265.870	15.627	45.454	Lbs.	LOAD PIN 3X
2	-882.108	-20.219	433.850	31.739	37.632	Lbs.	LOAD PIN 3Y
3	-601.877	-9.254	111.811	26.636	28.197	Lbs.	LOAD PIN 4X
4	-2037.015	2.716	1089.463	47.278	47.356	Lbs.	LOAD PIN 4Y
5	-43.110	35.745	215.548	7.991	36.627	Lbs.	LOAD PIN 5X
6	-1403.602	-27.000	463.453	54.239	60.588	Lbs.	LOAD PIN 5Y
7	-126.936	-45.729	219.176	20.227	50.003	Lbs.	LOAD PIN 6X
8	-65.651	-34.307	-11.489	16.175	37.929	Lbs.	LOAD PIN 6Y
9	-3740.603	-238.354	167.874	123.387	268.397	Lbs.	LOAD PIN 1
10	-354.189	6.218	786.425	24.584	25.359	LBS.	STRAIN GAGE S1
11	-897.411	5.618	1494.249	33.897	34.359	LBS.	STRAIN GAGE S2
12	-20.534	-0.535	49.480	1.658	1.742	MICRO-IN.	STRAIN S3
13	-290.808	-4.413	707.761	17.689	18.232	MICRO-IN.	STRAIN S4A
14	-123.900	2.071	81.859	3.556	4.115	MICRO-IN.	STRAIN S4B
15	-248.477	-13.533	903.083	16.949	21.689	MICRO-IN.	STRAIN S5A
16	-172.161	4.895	73.526	3.268	5.885	MICRO-IN.	STRAIN S5B
17	-187.358	-9.664	265.195	7.095	11.989	MICRO-IN.	STRAIN S6A
18	-51.581	4.832	58.541	1.917	5.198	MICRO-IN.	STRAIN S6B
19	-168.651	-5.376	319.288	6.928	8.769	MICRO-IN.	STRAIN S7A
20	-63.036	3.974	45.888	1.706	4.324	MICRO-IN.	STRAIN S7B
21	-15.269	-8.596	0.099	0.745	8.629	Lbs.	WINCH CABLE LOAD
22	-29.662	-0.952	47.019	1.121	1.471	g.	TOP RIGHT ACC. A1
23	-63.568	-1.114	26.025	1.102	1.567	g.	TOP LEFT ACC. A2
26	-54.615	-0.952	41.322	1.241	1.564	g.	BOTTOM RIGHT ACC. A5
27	-39.917	-1.039	69.966	1.379	1.726	g.	BOTTOM LEFT ACC. A6
28	-7.332	-0.325	8.731	0.185	0.374	g.	HORSE ACC. A7X
29	-3.720	-0.132	3.093	0.102	0.167	g.	HORSE ACC. A7Y
30	-4.145	-0.144	5.601	0.140	0.201	g.	HORSE ACC. A7Z
31	63.322	65.303	67.145	0.163	65.303	Degrees	HORSE TILT-METER T1
32	-20.340	28.610	65.378	35.516	45.607	Degrees	GATE TILT-METER T2
33	298.349	298.485	298.813	0.095	298.485	Ft. WATER	U/S POOL
34	294.273	294.690	294.961	0.149	294.690	Ft. WATER	D/S POOL
35	95.867	175.161	4522.995	103.225	203.314	Lbs.	BUMPER PLATE R. SHEA
36	9.226	132.518	6016.890	138.011	191.332	Lbs.	BUMPER PLATE L. SHEA
37	35.034	124.631	6606.341	155.819	199.530	Lbs.	BUMPER PLATE R. MOME
38	-6.946	71.883	5643.518	122.333	141.889	Lbs.	BUMPER PLATE L. MOME
40	-0.283	-0.133	0.793	0.048	0.141	Volts	P3X
41	-1.357	-0.031	0.654	0.048	0.057	Volts	P3Y
42	-0.347	0.029	1.797	0.082	0.087	Volts	P4X
43	-3.237	0.005	1.829	0.078	0.078	Volts	P4Y
44	-0.537	-0.099	0.149	0.022	0.102	Volts	P5X
45	-1.284	-0.011	0.500	0.050	0.051	Volts	P5Y
46	-0.334	-0.132	0.667	0.058	0.144	Volts	P6X
47	-0.083	-0.051	-0.020	0.023	0.056	Volts	P6Y
49	-15.122	0.267	33.945	1.077	1.109	MICRO-IN.	Strain Gage S1
50	-40.009	0.238	62.604	1.491	1.509	MICRO-IN.	Strain Gage S2

Information File Name: **wicketus29a.inf**

Sample Rate: 1000.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/10/00 11:47:01 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST #29a Series 3b Condition B 8/10/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1-30 & 33-47 filtered at 200 Hz. Low Pass

Gate #6 @ raised, locked position & winch cable attached to bottom of gage.

\*\*\* POOL ELEVATIONS: 300ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, all gates up or closed, release gate #6 for bumper plate test from raised position.

CHAN NUM	STATISTICS				ROOT MEAN SQUARE	ENGINEERING UNITS	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION			
1	-102.258	-47.658	237.553	21.734	52.380	Lbs.	LOAD PIN 3X
2	-1639.344	32.775	738.025	52.807	62.152	Lbs.	LOAD PIN 3Y
3	-524.957	-8.413	120.534	21.892	23.453	Lbs.	LOAD PIN 4X
4	-1651.194	-12.637	419.820	59.935	61.253	Lbs.	LOAD PIN 4Y
5	-28.153	31.272	258.657	7.328	32.119	Lbs.	LOAD PIN 5X
6	-2910.487	-11.281	1202.330	88.061	88.780	Lbs.	LOAD PIN 5Y
7	-139.630	-63.008	179.403	27.203	68.630	Lbs.	LOAD PIN 6X
8	-1600.249	-16.762	285.583	67.684	69.729	Lbs.	LOAD PIN 6Y
9	-5328.946	-310.406	166.155	174.778	356.229	Lbs.	LOAD PIN 1
10	-768.850	-27.641	1749.887	47.455	54.918	LBS.	STRAIN GAGE S1
11	-327.068	-1.412	1388.150	42.881	42.904	LBS.	STRAIN GAGE S2
12	-26.544	0.415	37.442	2.375	2.411	MICRO-IN.	STRAIN S3
13	-277.312	-13.166	831.031	19.044	23.152	MICRO-IN.	STRAIN S4A
14	-153.763	4.404	64.092	4.122	6.032	MICRO-IN.	STRAIN S4B
15	-246.821	-22.330	1011.419	18.353	28.905	MICRO-IN.	STRAIN S5A
16	-177.791	5.990	53.737	3.608	6.993	MICRO-IN.	STRAIN S5B
17	-179.428	-11.487	376.290	9.712	15.042	MICRO-IN.	STRAIN S6A
18	-73.562	4.523	52.783	2.863	5.353	MICRO-IN.	STRAIN S6B
19	-159.496	-6.541	407.186	10.041	11.984	MICRO-IN.	STRAIN S7A
20	-81.238	4.986	49.597	2.542	5.596	MICRO-IN.	STRAIN S7B
21	-23.231	-14.732	-4.523	1.085	14.772	Lbs.	WINCH CABLE LOAD
22	-17.200	-0.680	36.350	0.797	1.048	g.	TOP RIGHT ACC. A1
23	-57.070	-0.948	25.419	1.001	1.379	g.	TOP LEFT ACC. A2
26	-18.576	-0.629	8.344	0.291	0.693	g.	BOTTOM RIGHT ACC. A5
27	-27.654	-0.742	49.975	1.009	1.253	g.	BOTTOM LEFT ACC. A6
28	-4.748	-0.326	5.666	0.184	0.374	g.	HORSE ACC. A7X
29	-3.060	-0.122	2.952	0.100	0.158	g.	HORSE ACC. A7Y
30	-5.804	-0.147	3.424	0.226	0.269	g.	HORSE ACC. A7Z
31	62.930	65.268	69.154	0.227	65.268	Degrees	HORSE TILT-METER T1
32	-38.891	6.621	65.131	38.241	38.810	Degrees	GATE TILT-METER T2
33	300.448	300.639	300.848	0.080	300.639	Ft. WATER	U/S POOL
34	294.581	294.964	295.160	0.107	294.964	Ft. WATER	D/S POOL
35	7.788	99.902	5357.428	153.842	183.434	Lbs.	BUMPER PLATE R. SHEA
36	-29.757	78.878	6666.602	183.675	199.896	Lbs.	BUMPER PLATE L. SHEA
37	-8.041	86.557	7099.309	195.040	213.384	Lbs.	BUMPER PLATE R. MOME
38	-38.115	58.225	6400.475	167.382	177.220	Lbs.	BUMPER PLATE L. MOME
40	-0.330	-0.148	0.789	0.067	0.163	Volts	P3X
41	-5.000	0.100	2.358	0.161	0.190	Volts	P3Y
42	-0.376	0.026	1.733	0.068	0.072	Volts	P4X
43	-2.822	-0.021	0.696	0.099	0.101	Volts	P4Y
44	-0.701	-0.087	0.081	0.020	0.089	Volts	P5X
45	-2.651	0.004	1.121	0.080	0.080	Volts	P5Y
46	-0.396	-0.182	0.525	0.078	0.198	Volts	P6X
47	-2.451	-0.025	0.454	0.101	0.104	Volts	P6Y
49	-33.689	-1.224	77.613	2.084	2.417	MICRO-IN.	Strain Gage S1
50	-15.112	-0.137	62.942	1.885	1.890	MICRO-IN.	Strain Gage S2

Information File Name: **wicketds36a.inf**

Sample Rate: 500.000 samples/sec/channel

Length of Time Recorded: 00:00:45.00

Data Collected on 3/2/01 9:00:45 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST wicketds36a 03/02/01

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1-33 and 40- 47 filtered at 200 Hz. Low Pass

Gate #6 @ down position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 300 ft. Tail water

\*\*\* TEST CONDITION: wet, rotation from 0 to 65 degrees,  
gates 1, 7, 8 down during test.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING	UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-38.551	-16.780	22.423	12.143	20.713	Lbs.	LOAD PIN 3X
2	-48.428	31.266	117.268	14.571	34.495	Lbs.	LOAD PIN 3Y
3	-32.116	10.526	67.007	29.609	31.424	Lbs.	LOAD PIN 4X
4	-15.333	61.680	111.652	20.174	64.895	Lbs.	LOAD PIN 4Y
5	-5.279	16.192	32.552	6.944	17.618	Lbs.	LOAD PIN 5X
6	-23.258	51.942	148.004	17.215	54.720	Lbs.	LOAD PIN 5Y
7	-52.055	-24.194	6.348	8.093	25.512	Lbs.	LOAD PIN 6X
8	-37.749	34.606	108.325	17.579	38.815	Lbs.	LOAD PIN 6Y
9	-346.535	14.279	99.001	21.630	25.918	Lbs.	LOAD PIN 1
10	-628.332	-46.662	20.868	19.132	50.432	LBS.	STRAIN GAGE S1
11	-108.761	-36.277	28.387	17.961	40.479	LBS.	STRAIN GAGE S2
12	-4.921	-0.344	3.985	0.710	0.789	MICRO-IN.	STRAIN S3
13	-5.379	7.964	23.312	4.164	8.987	MICRO-IN.	STRAIN S4A
14	-5.742	-0.963	15.633	1.377	1.680	MICRO-IN.	STRAIN S4B
15	-26.037	-6.253	9.303	6.366	8.923	MICRO-IN.	STRAIN S5A
16	-3.192	1.422	8.817	1.804	2.297	MICRO-IN.	STRAIN S5B
17	-19.264	-1.717	9.709	4.830	5.126	MICRO-IN.	STRAIN S6A
18	-4.828	-0.409	4.743	1.592	1.644	MICRO-IN.	STRAIN S6B
19	-12.603	5.293	15.875	4.567	6.991	MICRO-IN.	STRAIN S7A
20	-6.054	-1.510	5.278	1.685	2.262	MICRO-IN.	STRAIN S7B
21	-32.305	36.478	199.323	44.292	57.380	Lbs.	WINCH CABLE LOAD
22	-1.809	-0.041	1.367	0.050	0.065	g.	TOP RIGHT ACC. A1
23	-1.195	-0.052	1.570	0.042	0.067	g.	TOP LEFT ACC. A2
26	-1.494	-0.044	0.461	0.039	0.059	g.	BOTTOM RIGHT ACC. A5
27	-1.698	-0.040	1.304	0.051	0.065	g.	BOTTOM LEFT ACC. A6
31	-0.507	42.500	66.507	22.432	48.056	Degrees	HORSE TILT-METER T1
32	-0.582	42.509	66.369	22.545	48.117	Degrees	GATE TILT-METER T2
33	299.785	300.327	300.867	0.237	300.327	Ft. WATER	U/S POOL
34	299.695	300.153	300.631	0.246	300.153	Ft. WATER	D/S POOL
40	-0.242	-0.104	0.120	0.075	0.128	Volts	P3X
41	-0.298	0.191	0.762	0.089	0.210	Volts	P3Y
42	-0.410	-0.065	0.188	0.182	0.193	Volts	P4X
43	-0.103	0.383	0.703	0.125	0.403	Volts	P4Y
44	-0.178	-0.090	0.032	0.038	0.098	Volts	P5X
45	-0.105	0.240	0.671	0.080	0.253	Volts	P5Y
46	-0.313	-0.140	-0.010	0.047	0.147	Volts	P6X
47	-1.487	-0.873	-0.479	0.168	0.889	Volts	P6Y
48	-42.682	-26.578	-19.797	5.258	27.093	Degrees	Winch cable angle

Information File Name: **wicketds34a.inf**

Sample Rate: 1000.000 samples/sec/channel

Length of Time Recorded: 00:00:10.00

Data Collected on 11/3/00 8:21:40 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST 34a 11/03/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1-30 & 33-47 filtered at 200 Hz. Low Pass

Gate #6 @ raised, locked position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 293 ft. Tail water

\*\*\* TEST CONDITION: wet, Drop gate 6 from unlocked up position,  
gates 7, 8, & 9 down during test.

CHAN NUM	STATISTICS					ROOT MEAN SQUARE	ENGINEERING UNITS	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION				
1	-118.800	12.130	72.775	13.872		18.427	Lbs.	LOAD PIN 3X
2	-506.692	-31.691	195.713	114.337		118.648	Lbs.	LOAD PIN 3Y
3	-88.814	-6.487	233.931	22.335		23.258	Lbs.	LOAD PIN 4X
4	-112.438	-22.720	283.062	52.580		57.279	Lbs.	LOAD PIN 4Y
5	-63.784	0.724	94.137	8.338		8.370	Lbs.	LOAD PIN 5X
6	-618.974	-41.420	367.896	70.362		81.648	Lbs.	LOAD PIN 5Y
7	-114.691	-3.803	135.428	8.342		9.168	Lbs.	LOAD PIN 6X
8	-350.414	-17.031	393.087	41.330		44.701	Lbs.	LOAD PIN 6Y
10	-211.510	8.395	474.159	82.817		83.241	LBS.	STRAIN GAGE S1
11	-192.182	13.374	149.341	18.820		23.088	LBS.	STRAIN GAGE S2
12	-15.012	3.592	16.114	4.568		5.811	MICRO-IN.	STRAIN S3
13	-96.218	20.266	172.745	31.925		37.814	MICRO-IN.	STRAIN S4A
14	-42.806	-5.466	25.237	7.244		9.074	MICRO-IN.	STRAIN S4B
15	-66.346	17.867	273.101	18.488		25.710	MICRO-IN.	STRAIN S5A
16	-62.642	-3.845	17.350	3.992		5.543	MICRO-IN.	STRAIN S5B
17	-65.780	14.152	157.988	17.723		22.680	MICRO-IN.	STRAIN S6A
18	-12.681	-2.992	17.656	5.911		6.626	MICRO-IN.	STRAIN S6B
19	-38.907	14.821	58.130	20.900		25.622	MICRO-IN.	STRAIN S7A
20	-16.192	-2.333	12.966	4.033		4.659	MICRO-IN.	STRAIN S7B
21	-23.947	68.842	270.037	128.634		145.897	Lbs.	WINCH CABLE LOAD
22	-29.102	-1.175	17.529	0.747		1.392	g.	TOP RIGHT ACC. A1
23	-22.368	-1.610	21.236	0.621		1.726	g.	TOP LEFT ACC. A2
26	-16.776	-1.164	15.678	0.507		1.269	g.	BOTTOM RIGHT ACC. A5
27	-53.639	-1.184	26.015	1.173		1.667	g.	BOTTOM LEFT ACC. A6
28	-5.547	-1.265	1.493	0.141		1.273	g.	HORSE ACC. A7X
29	-19.754	-0.500	12.483	0.786		0.931	g.	HORSE ACC. A7Y
30	-4.394	-0.617	1.811	0.185		0.644	g.	HORSE ACC. A7Z
31	-0.291	27.816	79.887	33.020		43.175	Degrees	HORSE TILT-METER T1
32	-0.756	27.638	77.974	33.186		43.188	Degrees	GATE TILT-METER T2
33	300.015	300.389	300.512	0.094		300.389	Ft. WATER	U/S POOL
34	292.591	292.759	293.007	0.082		292.759	Ft. WATER	D/S POOL

Information File Name: **wicketds34b.inf**

Sample Rate: 1000.000 samples/sec/channel

Length of Time Recorded: 00:00:10.00

Data Collected on 11/3/00 8:37:35 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST 34b 11/03/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1-30 & 33-47 filtered at 200 Hz. Low Pass

Gate #6 @ raised, locked position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 293 ft. Tail water

\*\*\* TEST CONDITION: wet, Drop gate 6 from unlocked up position,  
gates 7, 8, & 9 down during test.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING	UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-118.407	12.211	73.955	11.693	16.906	Lbs.	LOAD PIN 3X
2	-637.967	-87.325	262.551	101.348	133.780	Lbs.	LOAD PIN 3Y
3	-179.215	-4.700	137.187	19.860	20.409	Lbs.	LOAD PIN 4X
4	-254.362	-8.254	273.626	47.222	47.938	Lbs.	LOAD PIN 4Y
5	-44.429	-3.441	113.932	8.485	9.156	Lbs.	LOAD PIN 5X
6	-798.693	-74.297	329.838	65.672	99.161	Lbs.	LOAD PIN 5Y
7	-106.650	-4.095	112.998	7.943	8.937	Lbs.	LOAD PIN 6X
8	-378.726	-24.660	368.878	36.456	44.014	Lbs.	LOAD PIN 6Y
10	-261.377	48.234	588.853	72.568	87.135	LBS.	STRAIN GAGE S1
11	-184.649	13.102	194.543	20.050	23.951	LBS.	STRAIN GAGE S2
12	-17.444	2.547	16.965	4.078	4.808	MICRO-IN.	STRAIN S3
13	-84.050	11.720	193.725	26.545	29.017	MICRO-IN.	STRAIN S4A
14	-48.936	-4.280	26.586	6.040	7.402	MICRO-IN.	STRAIN S4B
15	-71.434	13.231	283.914	16.500	21.150	MICRO-IN.	STRAIN S5A
16	-67.755	-2.684	22.585	3.544	4.446	MICRO-IN.	STRAIN S5B
17	-85.705	8.983	177.146	15.124	17.591	MICRO-IN.	STRAIN S6A
18	-14.016	-1.040	20.326	4.772	4.884	MICRO-IN.	STRAIN S6B
19	-48.597	9.081	65.781	17.415	19.640	MICRO-IN.	STRAIN S7A
20	-18.875	-0.996	15.284	3.367	3.512	MICRO-IN.	STRAIN S7B
21	-45.968	26.903	265.633	104.845	108.242	Lbs.	WINCH CABLE LOAD
22	-33.691	-1.173	23.389	0.880	1.466	g.	TOP RIGHT ACC. A1
23	-19.927	-1.607	22.554	0.633	1.728	g.	TOP LEFT ACC. A2
26	-22.364	-1.165	17.835	0.599	1.310	g.	BOTTOM RIGHT ACC. A5
27	-74.896	-1.182	22.692	1.416	1.844	g.	BOTTOM LEFT ACC. A6
28	-5.351	-1.265	2.666	0.169	1.277	g.	HORSE ACC. A7X
29	-24.996	-0.494	17.774	0.950	1.070	g.	HORSE ACC. A7Y
30	-4.126	-0.619	2.178	0.180	0.645	g.	HORSE ACC. A7Z
31	-0.340	17.317	80.083	28.917	33.705	Degrees	HORSE TILT-METER T1
32	-0.707	17.052	78.073	28.860	33.521	Degrees	GATE TILT-METER T2
33	299.759	300.259	300.464	0.196	300.259	Ft. WATER	U/S POOL
34	292.374	292.919	294.002	0.421	292.920	Ft. WATER	D/S POOL

Information File Name: **wicketds34c.inf**

Sample Rate: 1000.000 samples/sec/channel

Length of Time Recorded: 00:00:10.00

Data Collected on 11/3/00 8:55:26 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST 34c 11/03/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1-30 & 33-47 filtered at 200 Hz. Low Pass

Gate #6 @ raised, locked position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 293 ft. Tail water

\*\*\* TEST CONDITION: wet, Drop gate 6 from unlocked up position,  
gates 7, 8, & 9 down during test.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS		
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-94.017	14.619	86.937	11.534	18.621 Lbs.		LOAD PIN 3X
2	-676.790	-107.853	267.354	86.409	138.198 Lbs.		LOAD PIN 3Y
3	-114.983	-2.240	204.590	18.231	18.368 Lbs.		LOAD PIN 4X
4	-164.333	-0.367	305.077	43.889	43.891 Lbs.		LOAD PIN 4Y
5	-56.306	-4.353	96.776	8.485	9.536 Lbs.		LOAD PIN 5X
6	-688.219	-84.028	415.997	58.033	102.120 Lbs.		LOAD PIN 5Y
7	-128.657	-4.536	151.510	8.038	9.229 Lbs.		LOAD PIN 6X
8	-13.951	-10.775	-5.744	1.672	10.904 Lbs.		LOAD PIN 6Y
10	-248.911	70.602	613.787	64.434	95.584 LBS.		STRAIN GAGE S1
11	-212.272	16.772	214.632	18.587	25.035 LBS.		STRAIN GAGE S2
12	-19.025	1.491	17.816	3.604	3.900 MICRO-IN.		STRAIN S3
13	-104.820	7.399	203.585	23.823	24.946 MICRO-IN.		STRAIN S4A
14	-53.963	-4.103	27.322	5.417	6.796 MICRO-IN.		STRAIN S4B
15	-63.165	13.236	295.363	15.607	20.464 MICRO-IN.		STRAIN S5A
16	-65.929	-2.565	19.054	3.356	4.224 MICRO-IN.		STRAIN S5B
17	-74.849	6.878	184.809	13.477	15.131 MICRO-IN.		STRAIN S6A
18	-14.623	0.215	19.962	4.242	4.247 MICRO-IN.		STRAIN S6B
19	-44.645	6.888	66.419	15.636	17.086 MICRO-IN.		STRAIN S7A
20	-19.363	-0.682	20.042	2.995	3.071 MICRO-IN.		STRAIN S7B
21	-27.250	14.243	272.239	92.505	93.595 Lbs.		WINCH CABLE LOAD
22	-35.010	-1.165	21.826	0.864	1.451 g.		TOP RIGHT ACC. A1
23	-23.589	-1.602	22.017	0.707	1.751 g.		TOP LEFT ACC. A2
26	-25.159	-1.157	23.130	0.742	1.374 g.		BOTTOM RIGHT ACC. A5
27	-64.145	-1.174	30.169	1.324	1.770 g.		BOTTOM LEFT ACC. A6
28	-5.791	-1.261	1.835	0.156	1.270 g.		HORSE ACC. A7X
29	-18.608	-0.491	12.556	0.854	0.985 g.		HORSE ACC. A7Y
30	-6.056	-0.618	2.324	0.188	0.646 g.		HORSE ACC. A7Z
31	-0.340	13.609	80.279	26.384	29.687 Degrees		HORSE TILT-METER T1
32	-0.805	13.353	77.974	26.261	29.461 Degrees		GATE TILT-METER T2
33	299.967	300.479	300.736	0.225	300.479 Ft. WATER		U/S POOL
34	292.319	292.708	293.676	0.379	292.708 Ft. WATER		D/S POOL

Information File Name: **wicketds35a.inf**

Sample Rate: 1000.000 samples/sec/channel

Length of Time Recorded: 00:00:10.00

Data Collected on 11/3/00 9:13:18 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST 35a 11/03/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1-30 & 33-47 filtered at 200 Hz. Low Pass

Gate #6 @ raised, locked position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 302 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, Drop gate 6 from unlocked up position,  
gates 7, 8, & 9 down during test.

CHAN	STATISTICS					ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION	SQUARE		
1	-89.297	-15.800	42.485	15.348	22.027 Lbs.		LOAD PIN 3X
2	-318.183	18.738	341.397	102.936	104.627 Lbs.		LOAD PIN 3Y
3	-100.709	-0.159	210.538	19.436	19.437 Lbs.		LOAD PIN 4X
4	-176.520	-31.364	342.819	55.240	63.523 Lbs.		LOAD PIN 4Y
5	-51.028	39.857	140.766	39.566	56.161 Lbs.		LOAD PIN 5X
6	-645.932	-21.259	433.969	43.599	48.505 Lbs.		LOAD PIN 5Y
7	-101.994	1.751	150.240	29.062	29.115 Lbs.		LOAD PIN 6X
8	-13.130	-10.423	-6.975	0.923	10.464 Lbs.		LOAD PIN 6Y
10	-303.764	-18.942	386.892	100.596	102.364 LBS.		STRAIN GAGE S1
11	-219.806	-21.865	141.808	29.072	36.377 LBS.		STRAIN GAGE S2
12	-17.687	4.694	27.422	9.650	10.732 MICRO-IN.		STRAIN S3
13	-131.884	13.027	233.797	31.823	34.386 MICRO-IN.		STRAIN S4A
14	-55.434	-2.599	27.076	7.275	7.726 MICRO-IN.		STRAIN S4B
15	-142.674	9.308	294.727	18.201	20.443 MICRO-IN.		STRAIN S5A
16	-71.773	-2.003	35.734	3.863	4.351 MICRO-IN.		STRAIN S5B
17	-67.058	7.077	228.363	17.012	18.426 MICRO-IN.		STRAIN S6A
18	-33.796	-1.716	21.540	6.060	6.299 MICRO-IN.		STRAIN S6B
19	-76.268	9.834	127.242	17.782	20.320 MICRO-IN.		STRAIN S7A
20	-32.173	-1.600	26.874	3.625	3.962 MICRO-IN.		STRAIN S7B
21	-7.431	52.953	358.122	119.271	130.498 Lbs.		WINCH CABLE LOAD
22	-39.209	-1.163	22.021	0.875	1.456 g.		TOP RIGHT ACC. A1
23	-28.227	-1.597	22.896	0.786	1.780 g.		TOP LEFT ACC. A2
26	-18.246	-1.158	19.159	0.672	1.339 g.		BOTTOM RIGHT ACC. A5
27	-67.957	-1.171	19.955	1.295	1.746 g.		BOTTOM LEFT ACC. A6
28	-5.155	-1.260	1.689	0.161	1.270 g.		HORSE ACC. A7X
29	-25.362	-0.485	13.410	0.892	1.015 g.		HORSE ACC. A7Y
30	-5.567	-0.618	2.837	0.199	0.649 g.		HORSE ACC. A7Z
31	-0.389	16.589	81.407	28.961	33.375 Degrees		HORSE TILT-METER T1
32	-1.051	16.352	79.254	28.902	33.207 Degrees		GATE TILT-METER T2
33	301.922	302.085	302.226	0.031	302.085 Ft. WATER		U/S POOL
34	294.689	294.980	295.811	0.299	294.981 Ft. WATER		D/S POOL

Information File Name: **wicketds35b.inf**

Sample Rate: 1000.000 samples/sec/channel

Length of Time Recorded: 00:00:10.00

Data Collected on 11/3/00 9:30:24 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST 35b 11/03/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1-30 & 33-47 filtered at 200 Hz. Low Pass

Gate #6 @ raised, locked position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 302 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, Drop gate 6 from unlocked up position,  
gates 7, 8, & 9 down during test.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS		
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-94.017	-14.798	62.154	13.270	19.876 Lbs.		LOAD PIN 3X
2	-727.619	33.814	410.637	109.451	114.555 Lbs.		LOAD PIN 3Y
3	-120.137	0.524	239.482	19.330	19.337 Lbs.		LOAD PIN 4X
4	-182.811	-43.045	344.392	58.459	72.597 Lbs.		LOAD PIN 4Y
5	-33.872	43.290	135.487	40.681	59.405 Lbs.		LOAD PIN 5X
6	-873.753	-14.686	570.344	44.048	46.432 Lbs.		LOAD PIN 5Y
7	-86.335	3.996	198.910	31.403	31.656 Lbs.		LOAD PIN 6X
8	-14.772	-10.465	-7.386	0.782	10.495 Lbs.		LOAD PIN 6Y
10	-358.618	-29.978	758.400	100.534	104.909 LBS.		STRAIN GAGE S1
11	-275.052	-12.248	222.166	25.121	27.948 LBS.		STRAIN GAGE S2
12	-25.469	5.237	23.774	8.917	10.341 MICRO-IN.		STRAIN S3
13	-175.313	19.503	260.651	35.371	40.392 MICRO-IN.		STRAIN S4A
14	-64.261	-4.268	41.789	8.146	9.196 MICRO-IN.		STRAIN S4B
15	-166.208	12.451	351.549	20.096	23.640 MICRO-IN.		STRAIN S5A
16	-82.487	-2.601	36.708	4.357	5.074 MICRO-IN.		STRAIN S5B
17	-109.206	9.221	235.004	19.981	22.006 MICRO-IN.		STRAIN S6A
18	-42.290	-2.231	24.088	6.841	7.196 MICRO-IN.		STRAIN S6B
19	-91.442	13.276	175.059	21.555	25.315 MICRO-IN.		STRAIN S7A
20	-42.177	-2.276	28.948	4.253	4.824 MICRO-IN.		STRAIN S7B
21	-1.926	71.458	359.223	138.550	155.892 Lbs.		WINCH CABLE LOAD
22	-39.795	-1.164	29.688	1.022	1.549 g.		TOP RIGHT ACC. A1
23	-25.395	-1.598	27.486	0.781	1.779 g.		TOP LEFT ACC. A2
26	-20.600	-1.159	21.169	0.630	1.319 g.		BOTTOM RIGHT ACC. A5
27	-79.049	-1.173	37.401	1.464	1.876 g.		BOTTOM LEFT ACC. A6
28	-6.427	-1.260	2.275	0.183	1.273 g.		HORSE ACC. A7X
29	-24.558	-0.484	20.920	0.964	1.079 g.		HORSE ACC. A7Y
30	-5.885	-0.621	2.691	0.198	0.651 g.		HORSE ACC. A7Z
31	-0.340	20.045	81.162	30.823	36.767 Degrees		HORSE TILT-METER T1
32	-1.347	19.811	78.959	30.808	36.628 Degrees		GATE TILT-METER T2
33	301.954	302.087	302.162	0.020	302.087 Ft. WATER		U/S POOL
34	294.327	294.790	295.413	0.288	294.791 Ft. WATER		D/S POOL



Information File Name: **wicketds35c.inf**

Sample Rate: 1000.000 samples/sec/channel

Length of Time Recorded: 00:00:10.00

Data Collected on 11/3/00 9:46:49 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST 35c 11/03/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1-30 & 33-47 filtered at 200 Hz. Low Pass

Gate #6 @ raised, locked position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 302 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, Drop gate 6 from unlocked up position,  
gates 7, 8, & 9 down during test.

CHAN NUM	STATISTICS				ROOT MEAN ENGINEERING UNITS SQUARE	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION		
1	-87.723	-11.987	70.021	11.715	16.761 Lbs.	LOAD PIN 3X
2	-509.493	9.219	489.082	103.561	103.970 Lbs.	LOAD PIN 3Y
3	-86.832	6.905	165.338	17.195	18.529 Lbs.	LOAD PIN 4X
4	-198.536	-16.120	277.164	42.824	45.758 Lbs.	LOAD PIN 4Y
5	-32.112	33.202	94.137	23.431	40.637 Lbs.	LOAD PIN 5X
6	-776.493	-8.873	531.229	49.394	50.184 Lbs.	LOAD PIN 5Y
7	-109.612	-6.122	127.387	21.752	22.597 Lbs.	LOAD PIN 6X
8	-521.927	-108.969	359.030	24.028	111.587 Lbs.	LOAD PIN 6Y
10	-410.978	-0.020	479.146	90.311	90.311 LBS.	STRAIN GAGE S1
11	-229.850	-13.338	131.763	18.352	22.687 LBS.	STRAIN GAGE S2
12	-23.888	2.722	18.910	5.746	6.358 MICRO-IN.	STRAIN S3
13	-131.465	12.890	241.140	28.543	31.318 MICRO-IN.	STRAIN S4A
14	-59.480	-3.058	29.161	6.387	7.081 MICRO-IN.	STRAIN S4B
15	-168.328	10.241	334.375	18.342	21.008 MICRO-IN.	STRAIN S5A
16	-78.348	-1.963	37.561	3.979	4.437 MICRO-IN.	STRAIN S5B
17	-82.129	5.980	225.680	16.219	17.287 MICRO-IN.	STRAIN S6A
18	-32.097	-0.730	22.025	5.192	5.243 MICRO-IN.	STRAIN S6B
19	-80.093	10.178	139.738	17.260	20.037 MICRO-IN.	STRAIN S7A
20	-44.495	-1.678	23.946	3.513	3.893 MICRO-IN.	STRAIN S7B
21	-6.330	45.844	326.191	111.033	120.125 Lbs.	WINCH CABLE LOAD
22	-45.459	-1.171	33.398	1.089	1.599 g.	TOP RIGHT ACC. A1
23	-25.542	-1.605	26.362	0.763	1.777 g.	TOP LEFT ACC. A2
26	-16.874	-1.165	18.865	0.595	1.308 g.	BOTTOM RIGHT ACC. A5
27	-82.812	-1.178	26.699	1.430	1.852 g.	BOTTOM LEFT ACC. A6
28	-5.253	-1.269	1.493	0.146	1.277 g.	HORSE ACC. A7X
29	-30.654	-0.492	17.409	0.965	1.083 g.	HORSE ACC. A7Y
30	-4.883	-0.623	3.546	0.244	0.669 g.	HORSE ACC. A7Z
31	-0.733	15.744	80.034	28.152	32.255 Degrees	HORSE TILT-METER T1
32	-1.297	15.540	78.762	28.069	32.083 Degrees	GATE TILT-METER T2
33	302.002	302.107	302.226	0.029	302.107 Ft. WATER	U/S POOL
34	294.979	295.233	295.467	0.103	295.233 Ft. WATER	D/S POOL

Information File Name: **wicketds35d.inf**

Sample Rate: 1000.000 samples/sec/channel

Length of Time Recorded: 00:00:10.00

Data Collected on 11/3/00 10:01:06 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST 35d 11/03/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1-30 & 33-47 filtered at 200 Hz. Low Pass

Gate #6 @ raised, locked position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 302 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, Drop gate 6 from unlocked up position,  
gates 7, 8, & 9 down during test.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN	ENGINEERING UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-93.231	-19.716	37.764	9.038	21.689	Lbs.	LOAD PIN 3X
2	-357.006	39.321	401.431	119.329	125.641	Lbs.	LOAD PIN 3Y
3	-119.344	2.076	202.211	24.771	24.858	Lbs.	LOAD PIN 4X
4	-166.692	-34.810	267.729	52.747	63.198	Lbs.	LOAD PIN 4Y
5	-29.473	24.367	92.817	5.746	25.036	Lbs.	LOAD PIN 5X
6	-750.063	9.741	534.400	56.141	56.980	Lbs.	LOAD PIN 5Y
7	-90.144	-14.958	159.551	7.479	16.724	Lbs.	LOAD PIN 6X
8	-558.856	-104.357	373.802	37.947	111.042	Lbs.	LOAD PIN 6Y
10	-308.751	-10.741	426.786	79.062	79.788	LBS.	STRAIN GAGE S1
11	-237.384	5.320	197.054	20.721	21.393	LBS.	STRAIN GAGE S2
12	-23.159	2.691	20.977	4.869	5.563	MICRO-IN.	STRAIN S3
13	-86.148	17.094	240.300	31.360	35.716	MICRO-IN.	STRAIN S4A
14	-57.763	-4.200	25.728	7.167	8.307	MICRO-IN.	STRAIN S4B
15	-140.765	13.403	324.410	20.981	24.896	MICRO-IN.	STRAIN S5A
16	-80.296	-2.539	30.986	4.452	5.125	MICRO-IN.	STRAIN S5B
17	-76.381	8.670	229.512	19.962	21.764	MICRO-IN.	STRAIN S6A
18	-29.791	-1.006	20.690	6.006	6.089	MICRO-IN.	STRAIN S6B
19	-81.878	13.407	164.093	20.261	24.295	MICRO-IN.	STRAIN S7A
20	-39.981	-2.261	27.850	3.943	4.546	MICRO-IN.	STRAIN S7B
21	-3.027	64.010	357.021	132.063	146.758	Lbs.	WINCH CABLE LOAD
22	-43.408	-1.172	32.227	1.102	1.609	g.	TOP RIGHT ACC. A1
23	-27.837	-1.606	26.314	0.786	1.788	g.	TOP LEFT ACC. A2
26	-20.109	-1.165	17.688	0.610	1.315	g.	BOTTOM RIGHT ACC. A5
27	-79.538	-1.178	24.500	1.497	1.904	g.	BOTTOM LEFT ACC. A6
28	-5.547	-1.268	2.226	0.157	1.278	g.	HORSE ACC. A7X
29	-31.288	-0.491	18.750	0.972	1.089	g.	HORSE ACC. A7Y
30	-5.078	-0.623	3.008	0.186	0.651	g.	HORSE ACC. A7Z
31	-0.586	18.398	80.917	29.762	34.989	Degrees	HORSE TILT-METER T1
32	-1.297	18.131	78.368	29.715	34.810	Degrees	GATE TILT-METER T2
33	301.970	302.197	302.274	0.027	302.197	Ft. WATER	U/S POOL
34	294.382	294.685	295.485	0.252	294.685	Ft. WATER	D/S POOL

Information File Name: **wicketds35e.inf**

Sample Rate: 1000.000 samples/sec/channel

Length of Time Recorded: 00:00:10.00

Data Collected on 11/3/00 10:14:02 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST

\*\*\* TEST 35e 11/03/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 1-30 & 33-47 filtered at 200 Hz. Low Pass

Gate #6 @ raised, locked position & winch cable attached to top of gage.

\*\*\* POOL ELEVATIONS: 302 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, Drop gate 6 from unlocked up position,  
gates 7, 8, & 9 down during test.

STATISTICS							TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING	UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
1	-88.904	-13.520	57.040	15.042	20.225	Lbs.	LOAD PIN 3X
2	-489.482	22.415	308.578	107.458	109.771	Lbs.	LOAD PIN 3Y
3	-105.467	4.529	155.425	22.095	22.554	Lbs.	LOAD PIN 4X
4	-185.563	-34.955	260.653	54.465	64.717	Lbs.	LOAD PIN 4Y
5	-40.030	42.978	137.687	37.748	57.202	Lbs.	LOAD PIN 5X
6	-816.137	-23.237	525.414	39.428	45.766	Lbs.	LOAD PIN 5Y
7	-119.346	-1.272	121.462	35.009	35.032	Lbs.	LOAD PIN 6X
8	-512.900	-123.197	343.438	44.736	131.068	Lbs.	LOAD PIN 6Y
10	-283.817	-12.834	538.986	104.809	105.592	LBS.	STRAIN GAGE S1
11	-214.783	-15.382	154.364	18.205	23.833	LBS.	STRAIN GAGE S2
12	-20.727	5.369	24.503	8.001	9.635	MICRO-IN.	STRAIN S3
13	-199.020	18.060	279.743	34.322	38.783	MICRO-IN.	STRAIN S4A
14	-60.583	-5.137	43.382	7.510	9.099	MICRO-IN.	STRAIN S4B
15	-171.297	13.800	353.245	21.095	25.208	MICRO-IN.	STRAIN S5A
16	-87.357	-2.524	33.299	4.633	5.276	MICRO-IN.	STRAIN S5B
17	-101.543	9.115	238.069	19.970	21.952	MICRO-IN.	STRAIN S6A
18	-37.679	-1.676	24.452	6.317	6.536	MICRO-IN.	STRAIN S6B
19	-102.153	13.039	165.751	20.536	24.326	MICRO-IN.	STRAIN S7A
20	-42.421	-2.248	31.510	4.426	4.964	MICRO-IN.	STRAIN S7B
21	-4.128	67.041	368.032	137.109	152.622	Lbs.	WINCH CABLE LOAD
22	-45.020	-1.173	32.959	1.072	1.589	g.	TOP RIGHT ACC. A1
23	-23.784	-1.607	28.364	0.774	1.783	g.	TOP LEFT ACC. A2
26	-19.570	-1.165	19.061	0.631	1.324	g.	BOTTOM RIGHT ACC. A5
27	-86.184	-1.178	35.446	1.594	1.982	g.	BOTTOM LEFT ACC. A6
28	-4.862	-1.268	3.253	0.176	1.280	g.	HORSE ACC. A7X
29	-26.508	-0.485	16.287	0.938	1.056	g.	HORSE ACC. A7Y
30	-5.078	-0.623	3.350	0.211	0.658	g.	HORSE ACC. A7Z
31	-0.586	18.877	81.211	30.313	35.710	Degrees	HORSE TILT-METER T1
32	-1.445	18.655	78.959	30.325	35.604	Degrees	GATE TILT-METER T2
33	302.210	302.337	302.435	0.030	302.337	Ft. WATER	U/S POOL
34	294.219	294.805	295.793	0.451	294.806	Ft. WATER	D/S POOL

Information File Name: **wicketds20a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 8:55:44 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #20a Series 1a Condition B 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test right side, one gate gap

Laser on d/s side of gate, taking data off back side of gate.

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN	ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
22	-0.159	-0.094	-0.028	0.019	0.096	g.	TOP RIGHT ACC. A1
23	-0.168	-0.089	-0.034	0.017	0.091	g.	TOP LEFT ACC. A2
32	65.033	65.099	65.279	0.026	65.099	Degrees	GATE TILT-METER T2
33	297.868	297.941	298.012	0.021	297.941	Ft. WATER	U/S POOL
34	294.563	294.750	295.069	0.165	294.750	Ft. WATER	D/S POOL
39	-2.900	-0.171	2.495	0.779	0.797	mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds20b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 8:57:25 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #20b Series 1a Condition B 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test right side, one gate gap  
Laser on d/s side of gate, taking data off back side of gate.

CHAN	MINIMUM	AVERAGE	STATISTICS MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.196	-0.093	0.097	0.020	0.095 g.	TOP RIGHT ACC. A1
23	-0.154	-0.092	-0.029	0.017	0.094 g.	TOP LEFT ACC. A2
32	64.935	65.102	65.328	0.027	65.102 Degrees	GATE TILT-METER T2
33	297.900	298.024	298.108	0.043	298.024 Ft. WATER	U/S POOL
34	294.617	294.794	295.015	0.114	294.794 Ft. WATER	D/S POOL
39	-2.505	-0.182	2.139	0.780	0.801 mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds20c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 8:58:13 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #20c Series 1a Condition B 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test right side, one gate gap

Laser on d/s side of gate, taking data off back side of gate.

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.210	-0.096	0.079	0.020	0.098 g.	TOP RIGHT ACC. A1
23	-0.168	-0.092	0.009	0.018	0.094 g.	TOP LEFT ACC. A2
32	65.033	65.101	65.279	0.026	65.101 Degrees	GATE TILT-METER T2
33	297.884	297.965	298.044	0.035	297.965 Ft. WATER	U/S POOL
34	294.599	294.926	295.142	0.160	294.926 Ft. WATER	D/S POOL
39	-2.324	-0.186	2.212	0.739	0.762 mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds21a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 9:02:19 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #21a Series 1b Condition B 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test left side, one gate gap  
Laser on d/s side of gate, taking data off back side of gate.

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.159	-0.097	-0.028	0.019	0.099 g.	TOP RIGHT ACC. A1
23	-0.168	-0.092	0.019	0.017	0.093 g.	TOP LEFT ACC. A2
32	64.836	65.111	65.328	0.027	65.111 Degrees	GATE TILT-METER T2
33	297.884	297.962	298.076	0.038	297.962 Ft. WATER	U/S POOL
34	294.581	294.919	295.124	0.153	294.919 Ft. WATER	D/S POOL
39	-2.251	-0.199	1.797	0.614	0.645 mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds21b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 9:03:13 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #21b Series 1b Condition B 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test left side, one gate gap

Laser on d/s side of gate, taking data off back side of gate.

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.168	-0.095	-0.010	0.020	0.097 g.	TOP RIGHT ACC. A1
23	-0.149	-0.093	-0.034	0.017	0.095 g.	TOP LEFT ACC. A2
32	64.935	65.113	65.279	0.026	65.113 Degrees	GATE TILT-METER T2
33	297.964	298.021	298.092	0.020	298.021 Ft. WATER	U/S POOL
34	294.563	294.867	295.051	0.140	294.867 Ft. WATER	D/S POOL
39	-2.129	-0.200	1.797	0.600	0.633 mm/s VEL.	LASER VELOCITY @ 50



Information File Name: **wicketds21c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 9:04:04 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #21c Series 1b Condition B 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test left side, one gate gap  
Laser on d/s side of gate, taking data off back side of gate.

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.243	-0.096	0.037	0.020	0.098 g.	TOP RIGHT ACC. A1
23	-0.154	-0.091	-0.029	0.018	0.093 g.	TOP LEFT ACC. A2
32	65.033	65.112	65.181	0.025	65.112 Degrees	GATE TILT-METER T2
33	297.964	298.013	298.076	0.017	298.013 Ft. WATER	U/S POOL
34	294.689	294.804	295.051	0.093	294.804 Ft. WATER	D/S POOL
39	-2.368	-0.205	1.733	0.601	0.635 mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds18a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/3/00 12:12:17 PM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #18a Series 1a Condition B 8/3/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 & 49 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees for 15 sec.

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, Laser test right side gate, laser on d/s side. gate @ 65 deg.

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.073	-0.055	-0.038	0.005	0.055 g.	TOP RIGHT ACC. A1
23	-0.067	-0.054	-0.039	0.004	0.054 g.	TOP LEFT ACC. A2
31	64.940	65.146	65.283	0.028	65.146 Degrees	HORSE TILT-METER T1
32	65.131	65.226	65.328	0.021	65.226 Degrees	GATE TILT-METER T2
33	298.188	298.297	298.397	0.050	298.297 Ft. WATER	U/S POOL
34	294.599	294.794	294.997	0.116	294.794 Ft. WATER	D/S POOL
39	-2.402	-0.309	1.733	0.632	0.703 mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds18b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/3/00 12:12:51 PM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #18b Series 1a Condition B 8/3/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 & 49 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees for 15 sec.

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, Laser test right side gate, laser on d/s side. gate @ 65 deg.

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.070	-0.054	-0.038	0.005	0.054 g.	TOP RIGHT ACC. A1
23	-0.070	-0.054	-0.036	0.004	0.054 g.	TOP LEFT ACC. A2
31	65.087	65.139	65.234	0.026	65.139 Degrees	HORSE TILT-METER T1
32	65.082	65.222	65.328	0.022	65.222 Degrees	GATE TILT-METER T2
33	298.268	298.457	298.621	0.106	298.457 Ft. WATER	U/S POOL
34	294.382	294.628	295.069	0.184	294.628 Ft. WATER	D/S POOL
39	-2.437	-0.283	6.206	0.707	0.762 mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds18c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/3/00 12:13:42 PM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #18c Series 1a Condition B 8/3/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to bottom of gate( u/s end )

Channel 1 - 30 and 40-47 & 49 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees for 15 sec.

\*\*\* POOL ELEVATIONS: 298 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, Laser test right side gate, laser on d/s side. gate @ 65 deg.

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.073	-0.057	-0.035	0.004	0.057 g.	TOP RIGHT ACC. A1
23	-0.067	-0.055	-0.043	0.004	0.055 g.	TOP LEFT ACC. A2
31	65.038	65.139	65.283	0.026	65.139 Degrees	HORSE TILT-METER T1
32	65.033	65.221	65.279	0.022	65.221 Degrees	GATE TILT-METER T2
33	298.317	298.419	298.493	0.038	298.419 Ft. WATER	U/S POOL
34	294.599	294.894	295.105	0.170	294.894 Ft. WATER	D/S POOL
39	-2.100	-0.302	1.230	0.472	0.561 mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds22a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 9:14:23 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #22a Series 1a Condition C 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test right side, one gate gap

Laser on d/s side of gate, taking data off back side of gate.

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING	UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE		
22	-0.271	-0.095	0.121	0.041	0.103	g.	TOP RIGHT ACC. A1
23	-0.211	-0.087	0.028	0.029	0.092	g.	TOP LEFT ACC. A2
32	64.836	65.128	65.328	0.026	65.128	Degrees	GATE TILT-METER T2
33	300.175	300.280	300.368	0.040	300.280	Ft. WATER	U/S POOL
34	294.599	294.863	295.069	0.130	294.863	Ft. WATER	D/S POOL
39	-8.032	-0.230	7.114	2.329	2.341	mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds22b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 9:15:19 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #22b Series 1a Condition C 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test right side, one gate gap

Laser on d/s side of gate, taking data off back side of gate.

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.290	-0.094	0.121	0.039	0.102 g.	TOP RIGHT ACC. A1
23	-0.211	-0.089	0.000	0.027	0.093 g.	TOP LEFT ACC. A2
32	64.935	65.127	65.181	0.024	65.127 Degrees	GATE TILT-METER T2
33	300.047	300.201	300.303	0.051	300.201 Ft. WATER	U/S POOL
34	294.545	294.829	295.069	0.160	294.829 Ft. WATER	D/S POOL
39	-7.891	-0.240	8.594	2.532	2.543 mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds22c.inf**  
 Sample Rate: 250.000 samples/sec/channel  
 Length of Time Recorded: 00:00:15.00  
 Data Collected on 8/7/00 9:16:08 AM  
 Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test  
 \*\*\* TEST #22c Series 1a Condition C 8/7/00  
 Balance and calibrated with wicket gate resting at 0 degrees  
 Winch cable, hooked to top of gate( d/s end )  
 Channel 22-34 filtered at 200 Hz. Low Pass  
 Gate #6 @ 65 degrees gate  
 \*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water  
 \*\*\* TEST CONDITION: wet, gate open #7 laser test right side, one gate gap  
 Laser on d/s side of gate, taking data off back side of gate.

STATISTICS						TYPE OF GAGE
CHAN NUM	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION	ROOT MEAN ENGINEERING UNITS SQUARE	
22	-0.262	-0.094	0.195	0.039	0.101 g.	TOP RIGHT ACC. A1
23	-0.230	-0.089	0.019	0.026	0.093 g.	TOP LEFT ACC. A2
32	65.033	65.127	65.279	0.024	65.127 Degrees	GATE TILT-METER T2
33	300.095	300.212	300.287	0.031	300.212 Ft. WATER	U/S POOL
34	294.581	294.863	295.015	0.099	294.863 Ft. WATER	D/S POOL
39	-7.827	-0.238	8.418	2.400	2.412 mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds23a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 9:23:12 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #23a Series 1b Condition C 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test left side, one gate gap

Laser located down stream of gate, looking at down stream side of gate.

CHAN NUM	STATISTICS				ROOT MEAN ENGINEERING UNITS SQUARE	TYPE OF GAGE
	MINIMUM MEASUREMENT	AVERAGE MEASUREMENT	MAXIMUM MEASUREMENT	STANDARD DEVIATION		
22	-0.364	-0.092	0.135	0.038	0.100 g.	TOP RIGHT ACC. A1
23	-0.297	-0.087	0.220	0.030	0.092 g.	TOP LEFT ACC. A2
32	64.935	65.136	65.230	0.026	65.136 Degrees	GATE TILT-METER T2
33	300.207	300.334	300.416	0.042	300.334 Ft. WATER	U/S POOL
34	294.617	294.850	295.051	0.143	294.850 Ft. WATER	D/S POOL
39	-6.230	-0.236	5.513	1.638	1.655 mm/s VEL.	LASER VELOCITY @ 50



Information File Name: **wicketds23b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 9:23:41 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #23b Series 1b Condition C 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test left side, one gate gap  
Laser located down stream of gate, looking at down stream side of gate.

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.262	-0.094	0.079	0.041	0.103 g.	TOP RIGHT ACC. A1
23	-0.230	-0.087	0.043	0.028	0.092 g.	TOP LEFT ACC. A2
32	64.984	65.136	65.279	0.025	65.136 Degrees	GATE TILT-METER T2
33	300.191	300.278	300.352	0.022	300.278 Ft. WATER	U/S POOL
34	294.527	294.755	295.069	0.163	294.755 Ft. WATER	D/S POOL
39	-6.973	-0.245	6.279	1.837	1.853 mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds23c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 9:24:52 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #23c Series 1b Condition C 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 295 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test left side, one gate gap  
Laser located down stream of gate, looking at down stream side of gate.

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.210	-0.094	0.046	0.036	0.101 g.	TOP RIGHT ACC. A1
23	-0.206	-0.091	0.047	0.026	0.095 g.	TOP LEFT ACC. A2
32	65.033	65.139	65.230	0.026	65.139 Degrees	GATE TILT-METER T2
33	300.111	300.182	300.303	0.020	300.182 Ft. WATER	U/S POOL
34	294.617	294.884	295.105	0.114	294.884 Ft. WATER	D/S POOL
39	-5.674	-0.247	5.234	1.589	1.608 mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds24a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 9:32:37 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #24a Series 3a Condition A 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 290 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test right side, one gate gap  
Laser located down stream of gate, looking at down stream side of gate.

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.290	-0.093	0.102	0.051	0.107 g.	TOP RIGHT ACC. A1
23	-0.278	-0.084	0.110	0.042	0.094 g.	TOP LEFT ACC. A2
32	65.131	65.191	65.230	0.026	65.191 Degrees	GATE TILT-METER T2
33	300.287	300.384	300.480	0.032	300.384 Ft. WATER	U/S POOL
34	289.714	289.946	290.275	0.160	289.946 Ft. WATER	D/S POOL
39	-6.743	-0.276	5.991	1.905	1.925 mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds24b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 9:33:41 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #24b Series 3a Condition A 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 290 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test right side, one gate gap

Laser located down stream of gate, looking at down stream side of gate.

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.341	-0.095	0.111	0.049	0.107 g.	TOP RIGHT ACC. A1
23	-0.230	-0.085	0.086	0.038	0.093 g.	TOP LEFT ACC. A2
32	65.131	65.189	65.230	0.024	65.189 Degrees	GATE TILT-METER T2
33	300.239	300.333	300.432	0.038	300.333 Ft. WATER	U/S POOL
34	289.732	290.085	290.275	0.139	290.085 Ft. WATER	D/S POOL
39	-6.309	-0.260	5.083	1.587	1.608 mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds24c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 9:34:18 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #24c Series 3a Condition A 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 290 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test right side, one gate gap

Laser located down stream of gate, looking at down stream side of gate.

STATISTICS						TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.313	-0.095	0.158	0.052	0.108 g.	TOP RIGHT ACC. A1
23	-0.245	-0.088	0.067	0.038	0.096 g.	TOP LEFT ACC. A2
32	65.082	65.188	65.476	0.026	65.188 Degrees	GATE TILT-METER T2
33	300.255	300.313	300.384	0.018	300.313 Ft. WATER	U/S POOL
34	289.859	290.167	290.347	0.105	290.167 Ft. WATER	D/S POOL
39	-5.962	-0.281	6.582	1.843	1.864 mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds25a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 9:37:07 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #25a Series 3b Condition A 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 290 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test left side, one gate gap  
Laser located down stream of gate, looking at down stream side of gate.

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.490	-0.095	0.293	0.055	0.109 g.	TOP RIGHT ACC. A1
23	-0.336	-0.086	0.172	0.042	0.096 g.	TOP LEFT ACC. A2
32	65.033	65.197	65.328	0.027	65.197 Degrees	GATE TILT-METER T2
33	300.207	300.299	300.368	0.028	300.299 Ft. WATER	U/S POOL
34	289.768	290.052	290.166	0.088	290.052 Ft. WATER	D/S POOL
39	-7.061	-0.273	6.426	1.723	1.744 mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds25b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 9:38:10 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #25b Series 3b Condition A 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 290 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test left side, one gate gap  
Laser located down stream of gate, looking at down stream side of gate.

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.327	-0.094	0.083	0.052	0.107 g.	TOP RIGHT ACC. A1
23	-0.288	-0.087	0.095	0.039	0.096 g.	TOP LEFT ACC. A2
32	65.033	65.198	65.378	0.028	65.198 Degrees	GATE TILT-METER T2
33	300.207	300.299	300.384	0.031	300.299 Ft. WATER	U/S POOL
34	289.642	289.813	290.148	0.145	289.813 Ft. WATER	D/S POOL
39	-6.431	-0.281	5.347	1.740	1.762 mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds25c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 9:38:38 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #25c Series 3b Condition A 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 290 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test left side, one gate gap  
Laser located down stream of gate, looking at down stream side of gate.

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.369	-0.092	0.116	0.055	0.107 g.	TOP RIGHT ACC. A1
23	-0.450	-0.085	0.138	0.043	0.095 g.	TOP LEFT ACC. A2
32	65.131	65.202	65.279	0.027	65.202 Degrees	GATE TILT-METER T2
33	300.287	300.351	300.432	0.024	300.351 Ft. WATER	U/S POOL
34	289.551	289.906	290.329	0.209	289.906 Ft. WATER	D/S POOL
39	-5.825	-0.276	7.056	1.662	1.685 mm/s VEL.	LASER VELOCITY @ 50



Information File Name: **wicketds26a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 9:42:32 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #26a Series 3a Condition B 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 285 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test right side, one gate gap  
Laser located down stream of gate, looking at down stream side of gate.

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.336	-0.093	0.228	0.069	0.116 g.	TOP RIGHT ACC. A1
23	-0.302	-0.087	0.095	0.049	0.100 g.	TOP LEFT ACC. A2
32	65.131	65.232	65.328	0.029	65.232 Degrees	GATE TILT-METER T2
33	300.175	300.287	300.416	0.046	300.287 Ft. WATER	U/S POOL
34	284.775	284.939	285.137	0.089	284.939 Ft. WATER	D/S POOL
39	-9.619	-0.262	9.995	3.035	3.047 mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds26b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 9:43:29 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #26b Series 3a Condition B 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 285 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test right side, one gate gap  
Laser located down stream of gate, looking at down stream side of gate.

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.336	-0.093	0.153	0.069	0.116 g.	TOP RIGHT ACC. A1
23	-0.264	-0.087	0.081	0.048	0.099 g.	TOP LEFT ACC. A2
32	65.131	65.231	65.328	0.028	65.231 Degrees	GATE TILT-METER T2
33	300.159	300.252	300.319	0.028	300.252 Ft. WATER	U/S POOL
34	284.793	284.945	285.245	0.087	284.945 Ft. WATER	D/S POOL
39	-9.639	-0.289	8.979	3.102	3.116 mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds26c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 9:43:57 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #26c Series 3a Condition B 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 285 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test right side, one gate gap  
Laser located down stream of gate, looking at down stream side of gate.

STATISTICS						TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.336	-0.094	0.139	0.068	0.116 g.	TOP RIGHT ACC. A1
23	-0.264	-0.087	0.129	0.047	0.099 g.	TOP LEFT ACC. A2
32	65.131	65.234	65.476	0.029	65.234 Degrees	GATE TILT-METER T2
33	300.368	300.524	300.672	0.081	300.524 Ft. WATER	U/S POOL
34	284.685	284.909	285.336	0.147	284.909 Ft. WATER	D/S POOL
39	-10.000	-0.274	9.995	3.114	3.126 mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds27a.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 9:45:50 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #27a Series 3b Condition B 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 285 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test left side, one gate gap  
Laser located down stream of gate, looking at down stream side of gate.

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.434	-0.094	0.186	0.071	0.117 g.	TOP RIGHT ACC. A1
23	-0.364	-0.087	0.129	0.048	0.099 g.	TOP LEFT ACC. A2
32	65.131	65.244	65.328	0.029	65.244 Degrees	GATE TILT-METER T2
33	300.127	300.257	300.400	0.053	300.257 Ft. WATER	U/S POOL
34	284.685	284.971	285.354	0.183	284.971 Ft. WATER	D/S POOL
39	-7.910	-0.287	6.104	1.693	1.718 mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds27b.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 9:46:24 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #27b Series 3b Condition B 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 285 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test left side, one gate gap  
Laser located down stream of gate, looking at down stream side of gate.

STATISTICS						TYPE OF GAGE
CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.439	-0.093	0.186	0.071	0.117 g.	TOP RIGHT ACC. A1
23	-0.326	-0.084	0.119	0.051	0.098 g.	TOP LEFT ACC. A2
32	65.131	65.247	65.328	0.029	65.247 Degrees	GATE TILT-METER T2
33	300.384	300.483	300.592	0.044	300.483 Ft. WATER	U/S POOL
34	284.775	285.106	285.535	0.221	285.106 Ft. WATER	D/S POOL
39	-8.052	-0.286	5.845	1.964	1.985 mm/s VEL.	LASER VELOCITY @ 50

Information File Name: **wicketds27c.inf**

Sample Rate: 250.000 samples/sec/channel

Length of Time Recorded: 00:00:15.00

Data Collected on 8/7/00 9:47:06 AM

Olmsted 1:5 Model HORSE WICKET GATE TEST Laser test

\*\*\* TEST #27c Series 3b Condition B 8/7/00

Balance and calibrated with wicket gate resting at 0 degrees

Winch cable, hooked to top of gate( d/s end )

Channel 22-34 filtered at 200 Hz. Low Pass

Gate #6 @ 65 degrees gate

\*\*\* POOL ELEVATIONS: 300 ft. Head water & 285 ft. Tail water

\*\*\* TEST CONDITION: wet, gate open #7 laser test left side, one gate gap  
Laser located down stream of gate, looking at down stream side of gate.

CHAN	MINIMUM	AVERAGE	MAXIMUM	STANDARD	ROOT MEAN ENGINEERING UNITS	TYPE OF GAGE
NUM	MEASUREMENT	MEASUREMENT	MEASUREMENT	DEVIATION	SQUARE	
22	-0.388	-0.095	0.149	0.068	0.116 g.	TOP RIGHT ACC. A1
23	-0.264	-0.085	0.081	0.048	0.097 g.	TOP LEFT ACC. A2
32	65.181	65.252	65.328	0.028	65.252 Degrees	GATE TILT-METER T2
33	300.319	300.436	300.528	0.039	300.436 Ft. WATER	U/S POOL
34	284.576	285.057	285.571	0.245	285.057 Ft. WATER	D/S POOL
39	-6.133	-0.290	5.459	1.815	1.838 mm/s VEL.	LASER VELOCITY @ 50



# **Appendix C**

## **Data Plots for 1:5-Scale Wicket Experiments**

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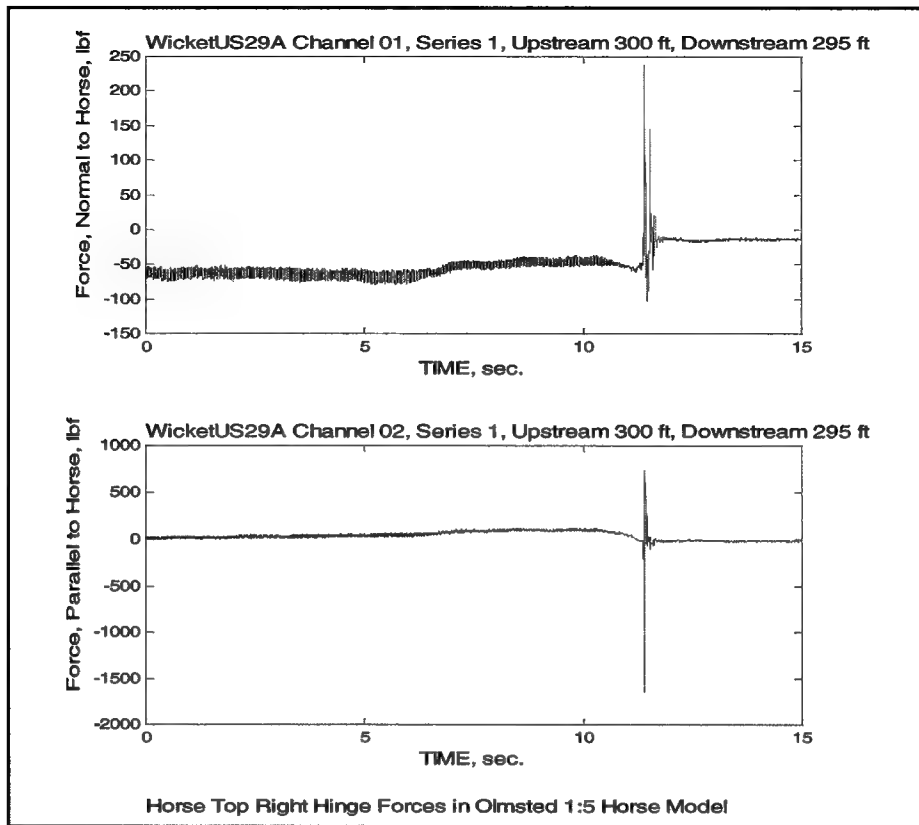


Figure C1. Bottom-lift drop test- no gap (WicketUS29A)

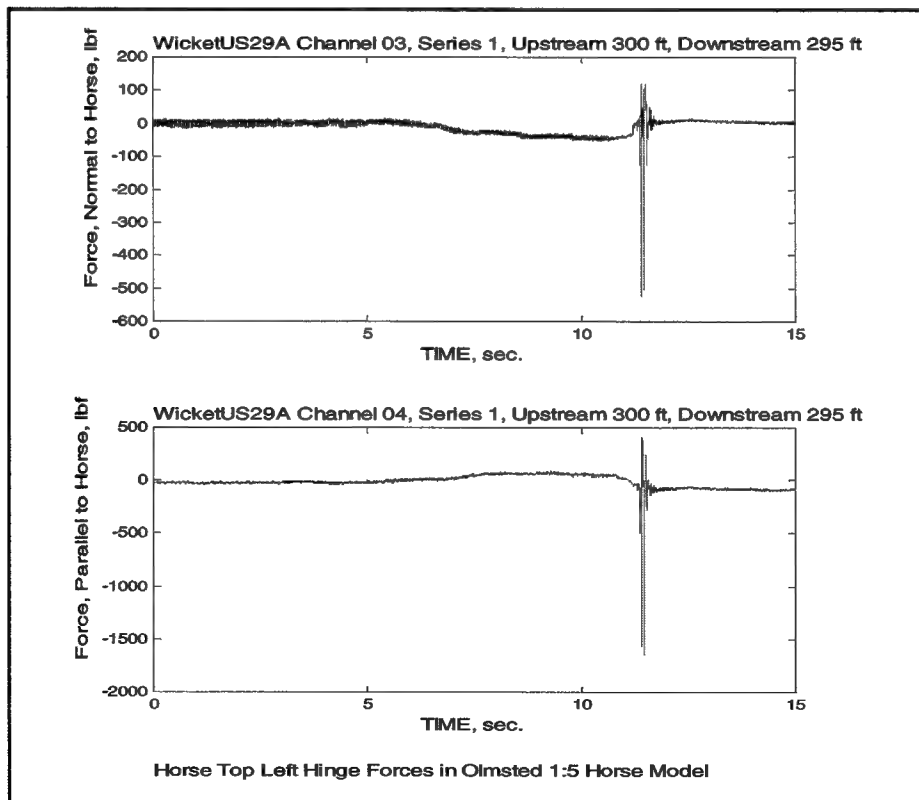


Figure C2. Bottom-lift drop test-no gap (WicketUS29A)

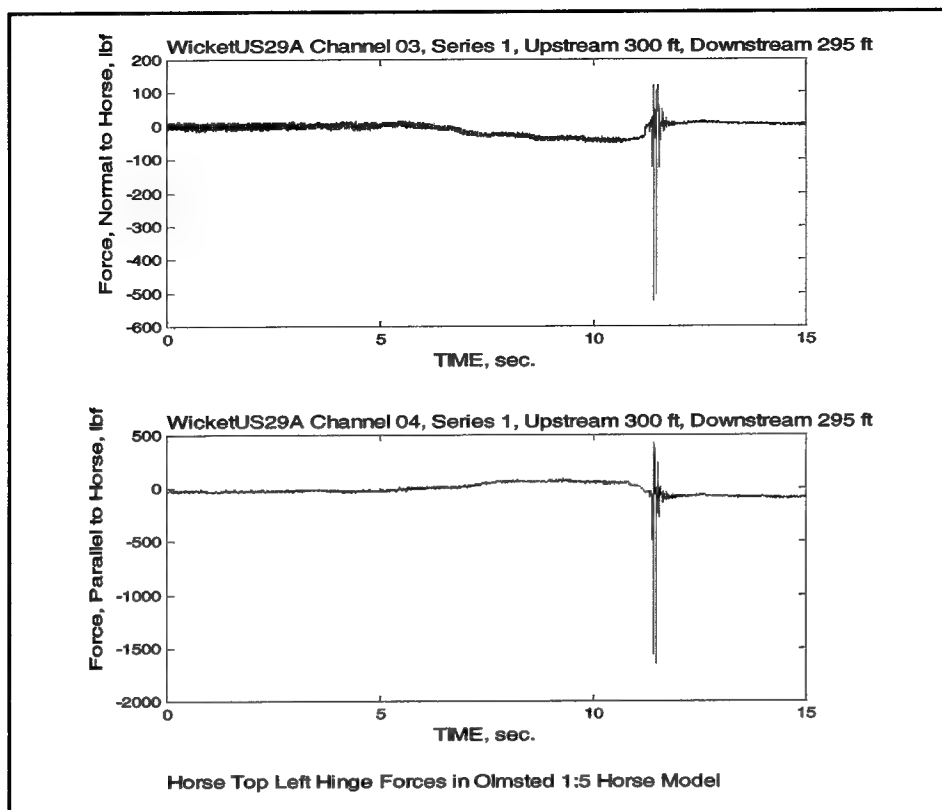


Figure C3. Bottom-lift drop test- no gap (WicketUS29A)

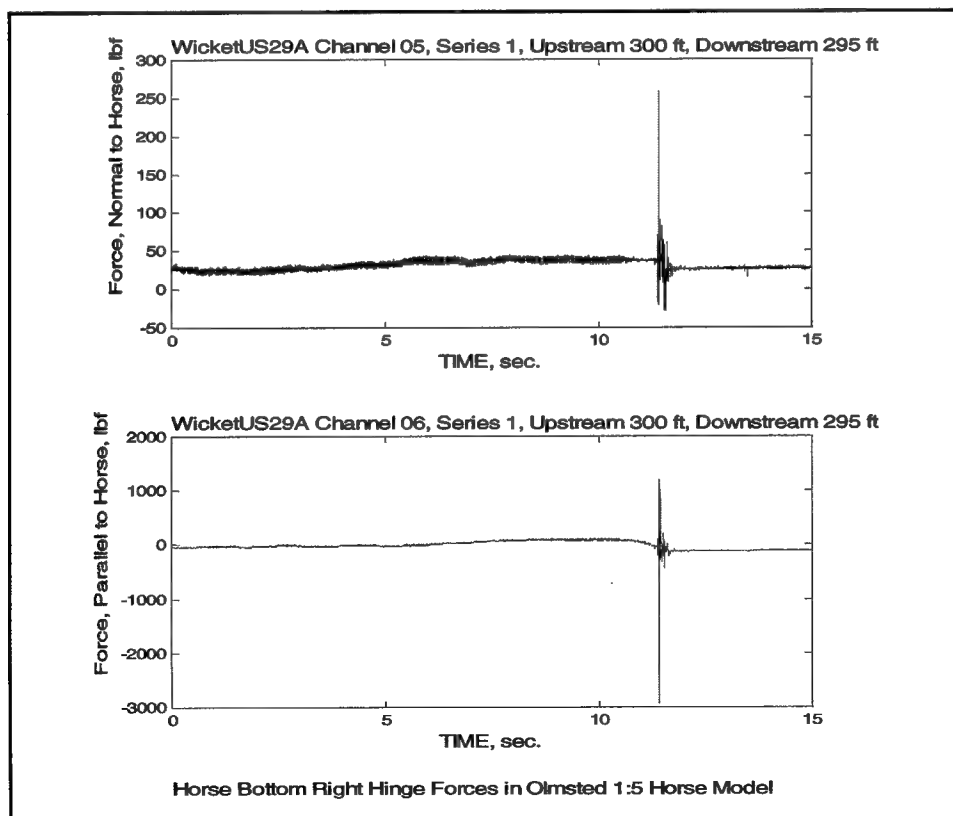


Figure C4. Bottom-lift drop test-no gap (WicketUS29A)

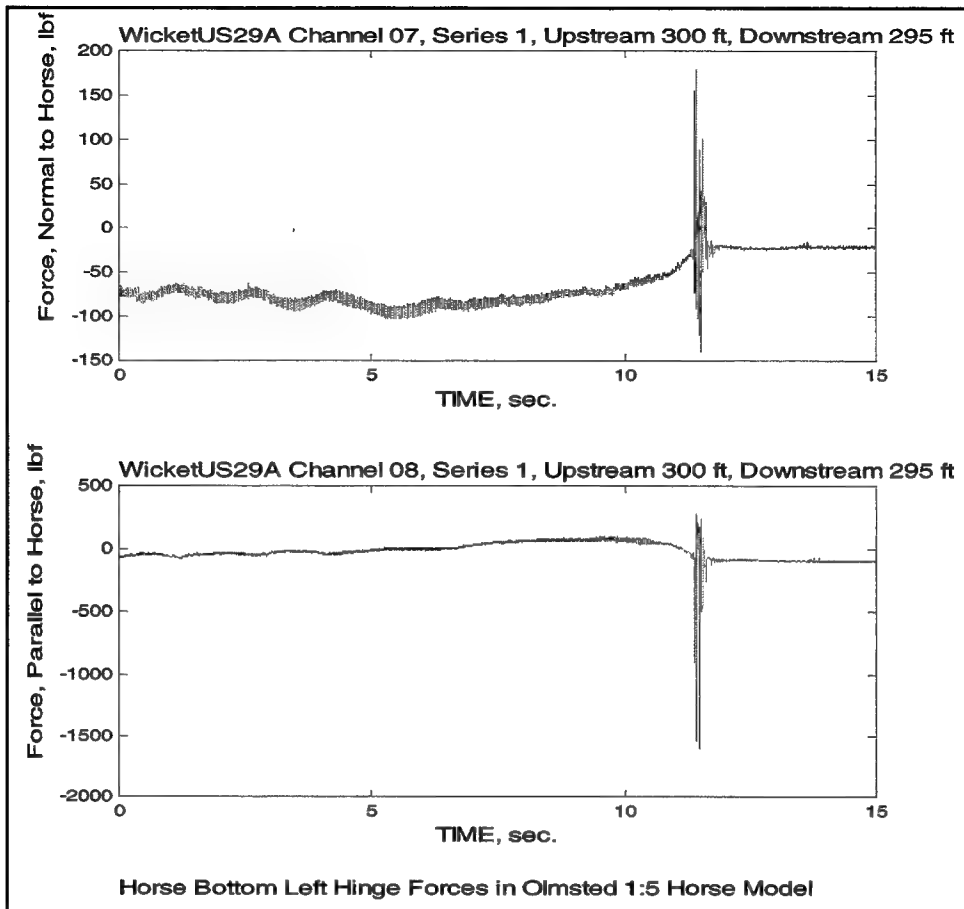


Figure C5. Bottom-lift drop test-no gap (WicketUS29A)

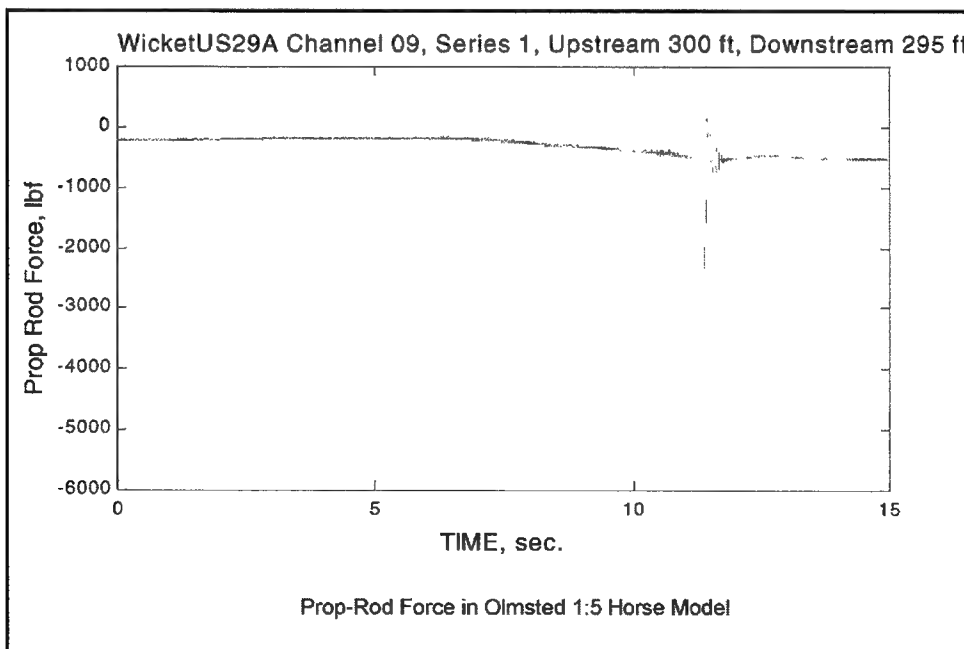


Figure C6. Prop-rod force-Bottom-lift drop test-no gap (WicketUS29A)

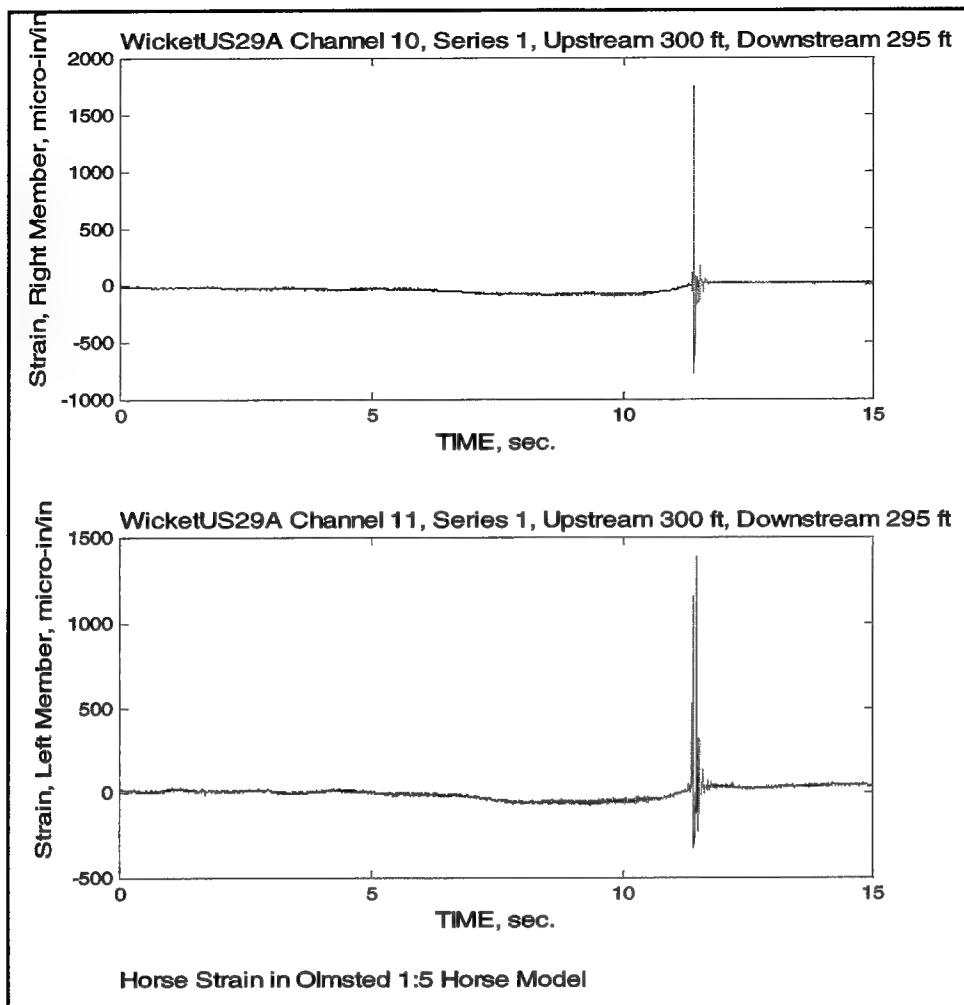


Figure C7. Horse strain-Bottom-lift drop test-no gap (WicketUS29A)

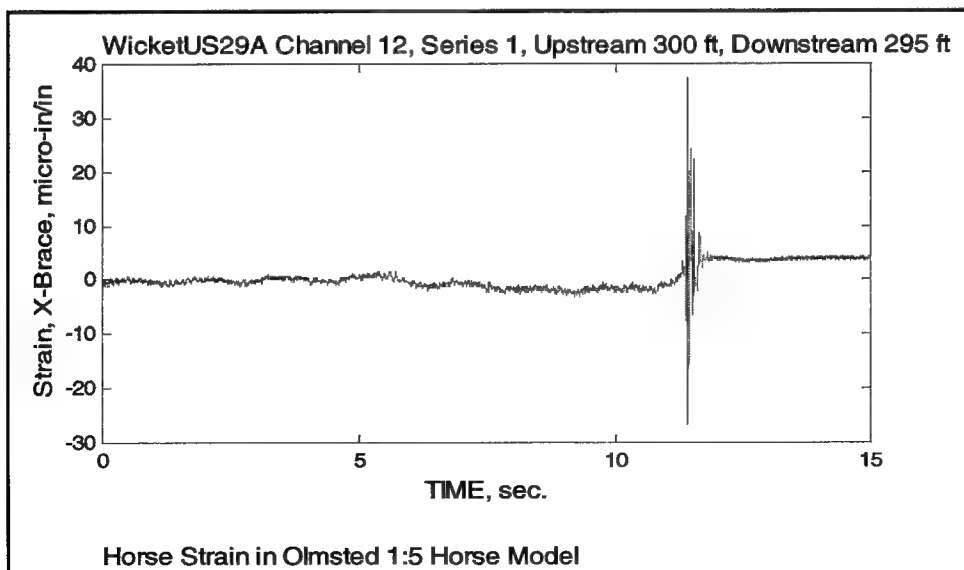


Figure C8. Horse strain-Bottom-lift drop test-no gap (WicketUS29A)

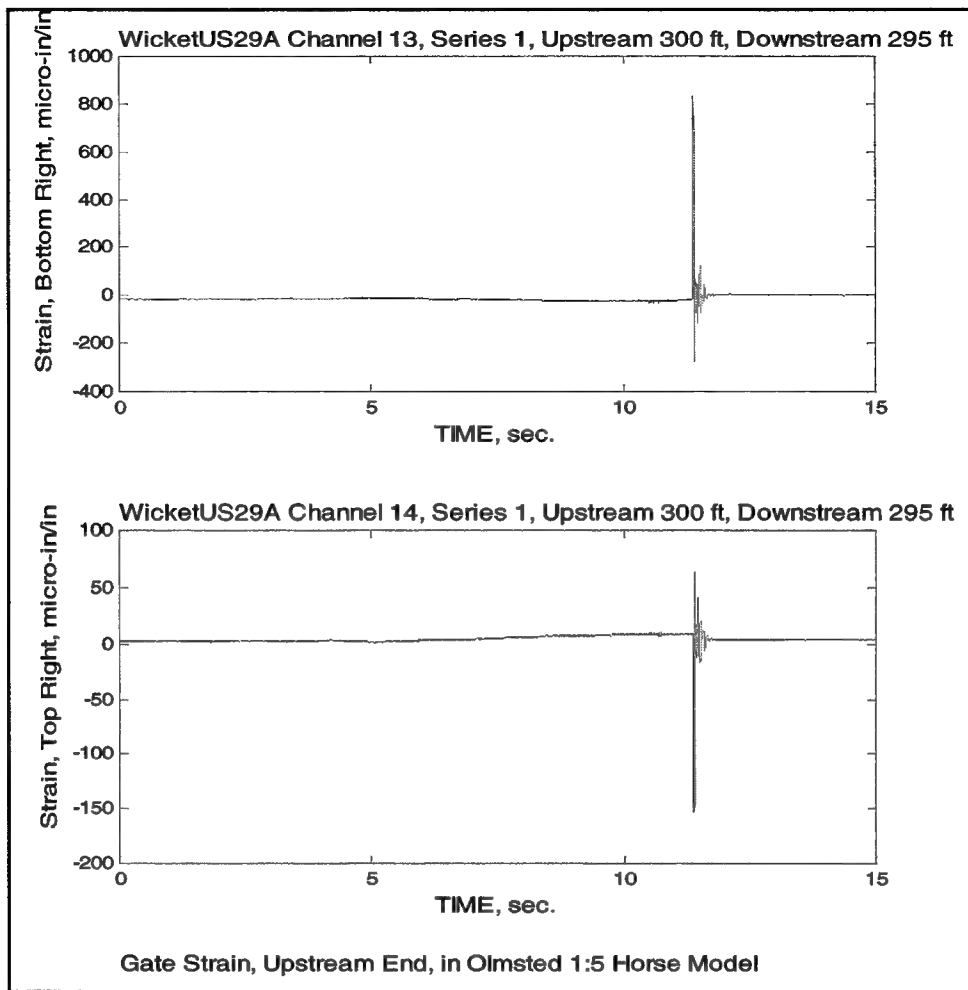


Figure C9. Gate strain-upstream end-Bottom-lift drop test-no gap (WicketUS29A)

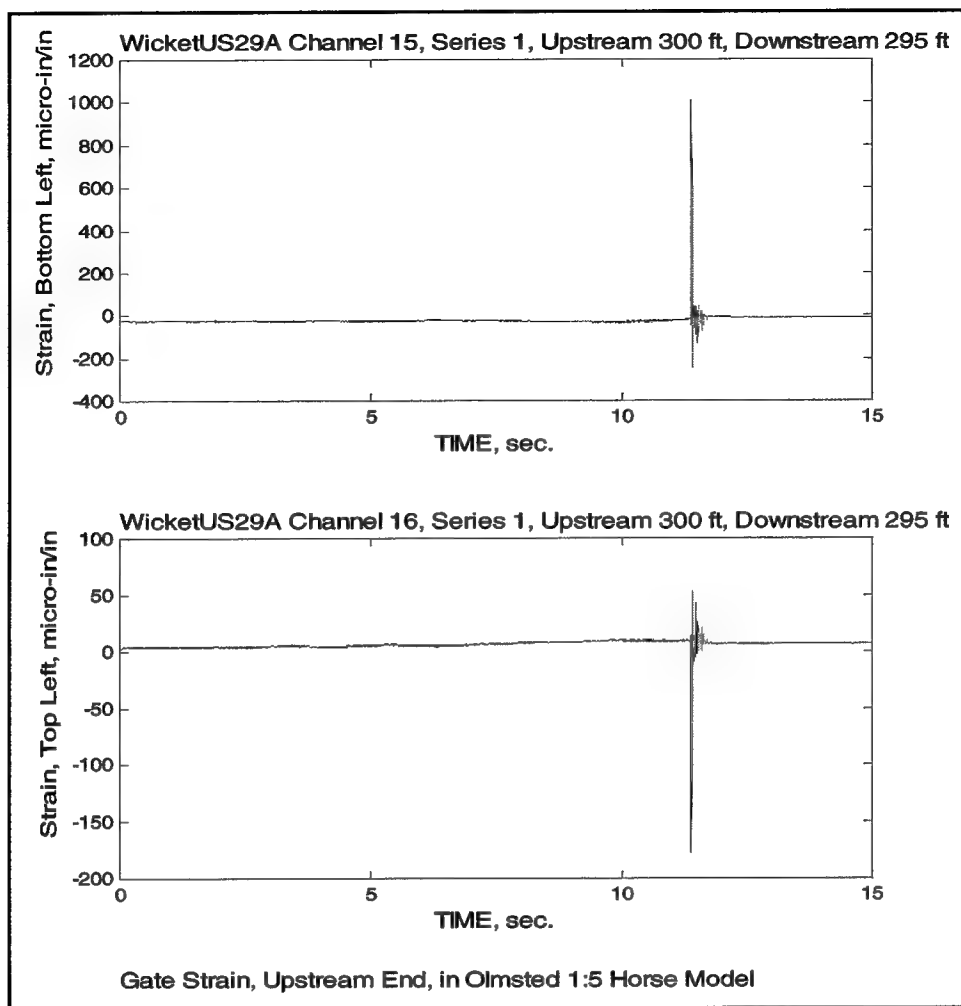


Figure C10. Gate strain-upstream end-Bottom-lift drop test-no gap (WicketUS29A)

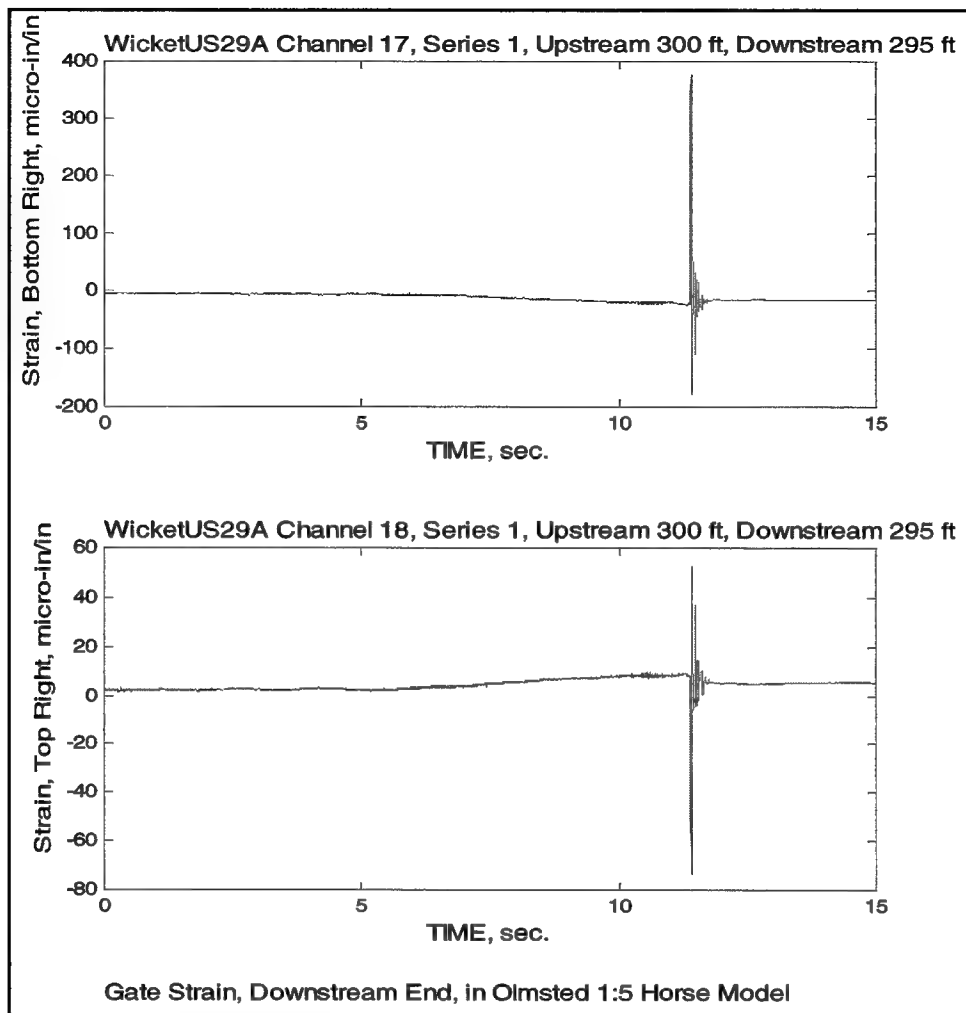


Figure C11. Gate strain-downstream end-Bottom-lift drop test-no gap (WicketUS29A)

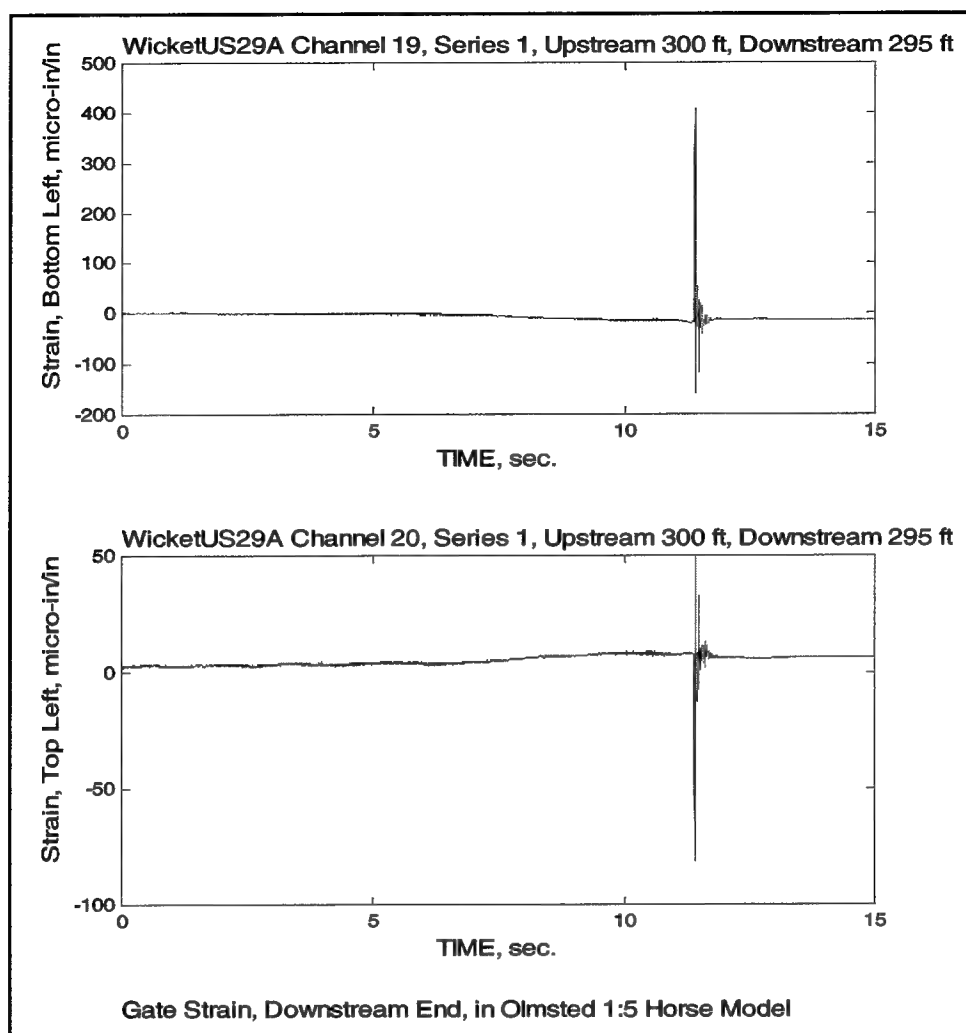


Figure C12. Gate strain-downstream end- Bottom-lift drop test-no gap (WicketUS29A)



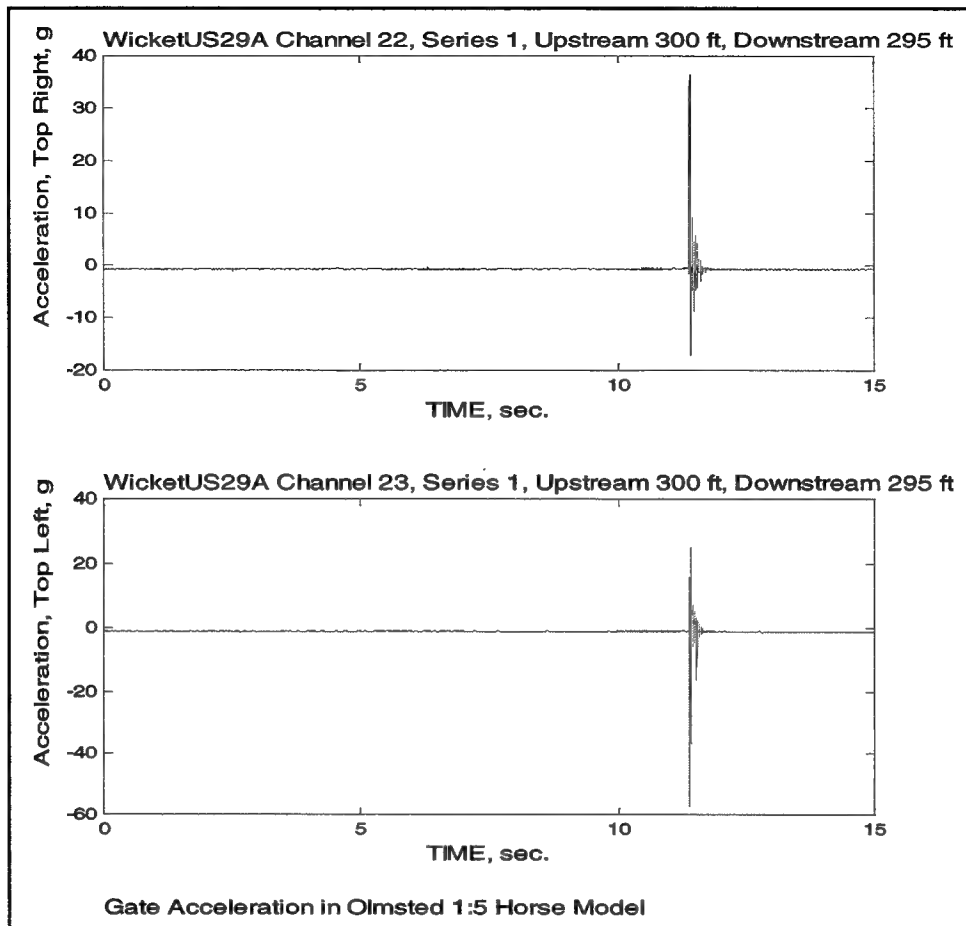


Figure C13. Gate acceleration-Bottom-lift drop test-no gap (WicketUS29A)

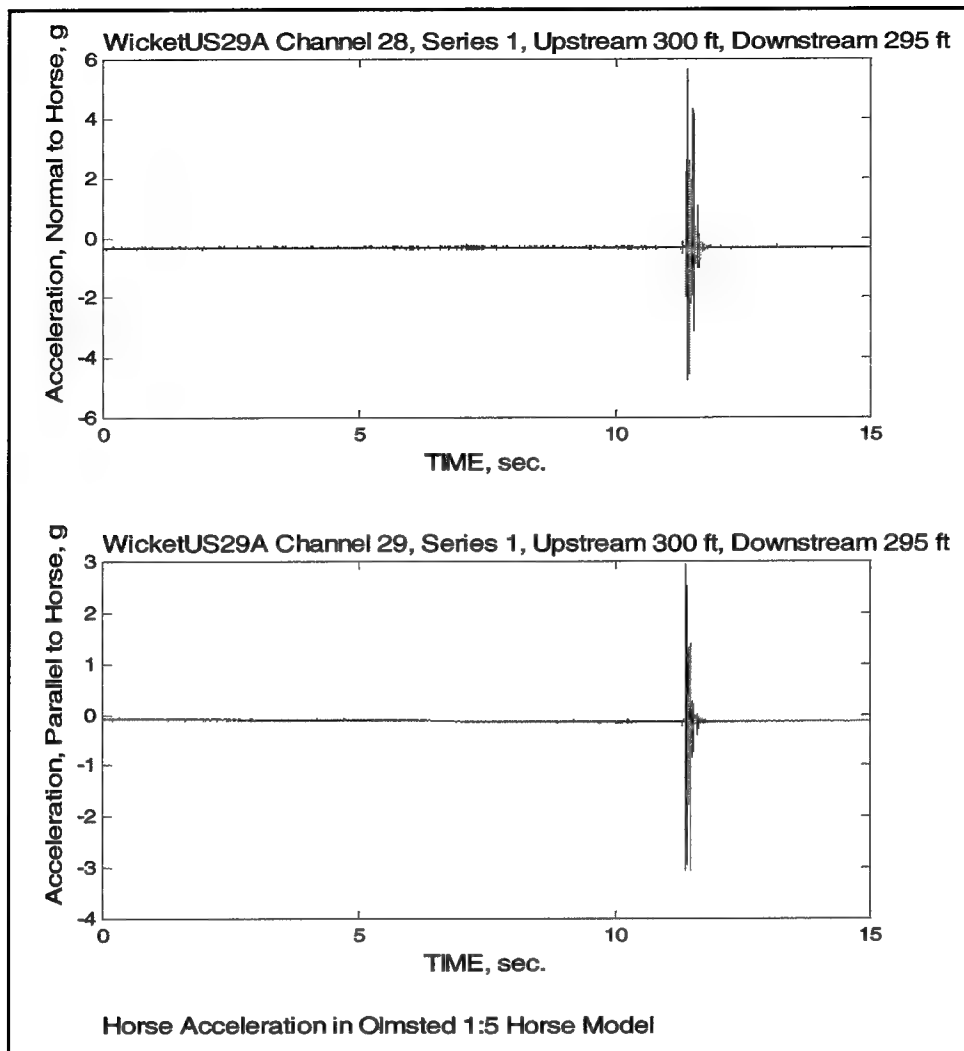


Figure C14. Horse acceleration-Bottom-lift drop test-no gap (WicketUS29A)

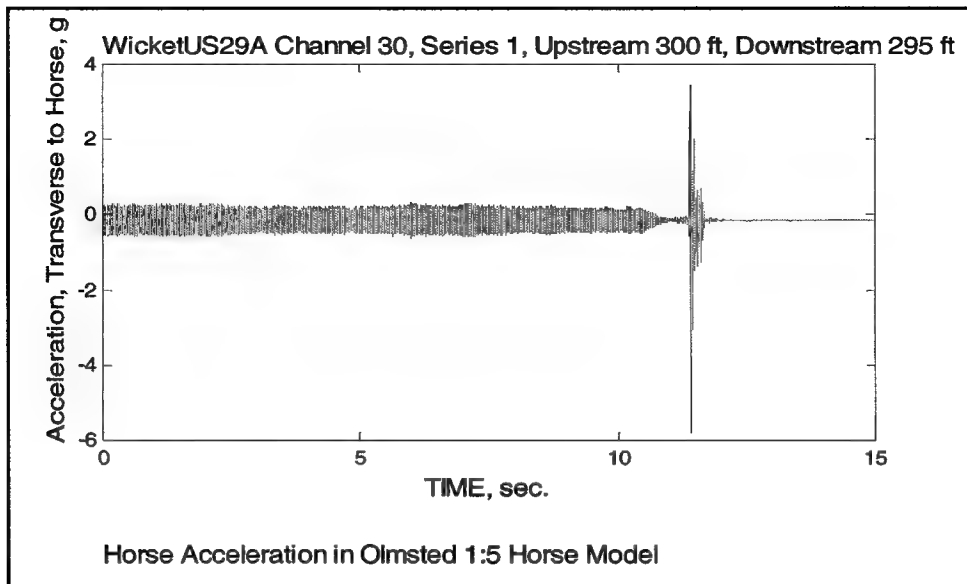


Figure C15. Horse Acceleration-Bottom-lift drop test-no gap (WicketUS29A)

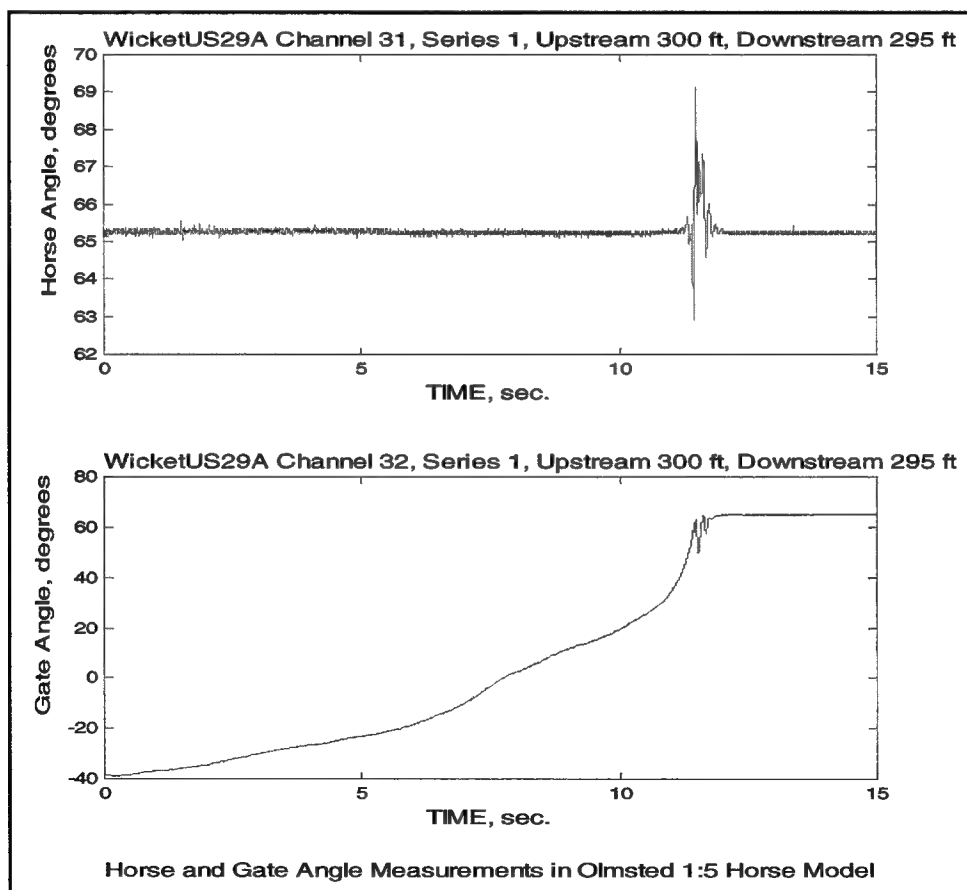


Figure C16. Horse and gate angle measurements-Bottom-lift drop test-no gap (WicketUS29A)

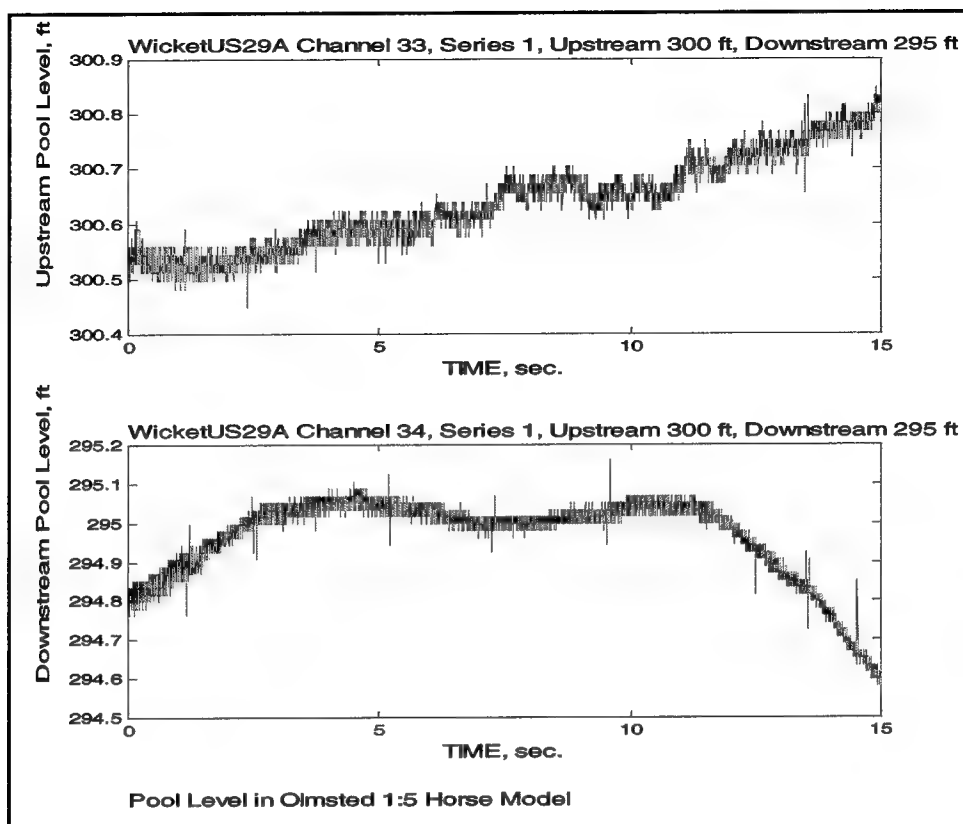


Figure C17. Pool level-Bottom-lift drop test-no gap (WicketUS29A)

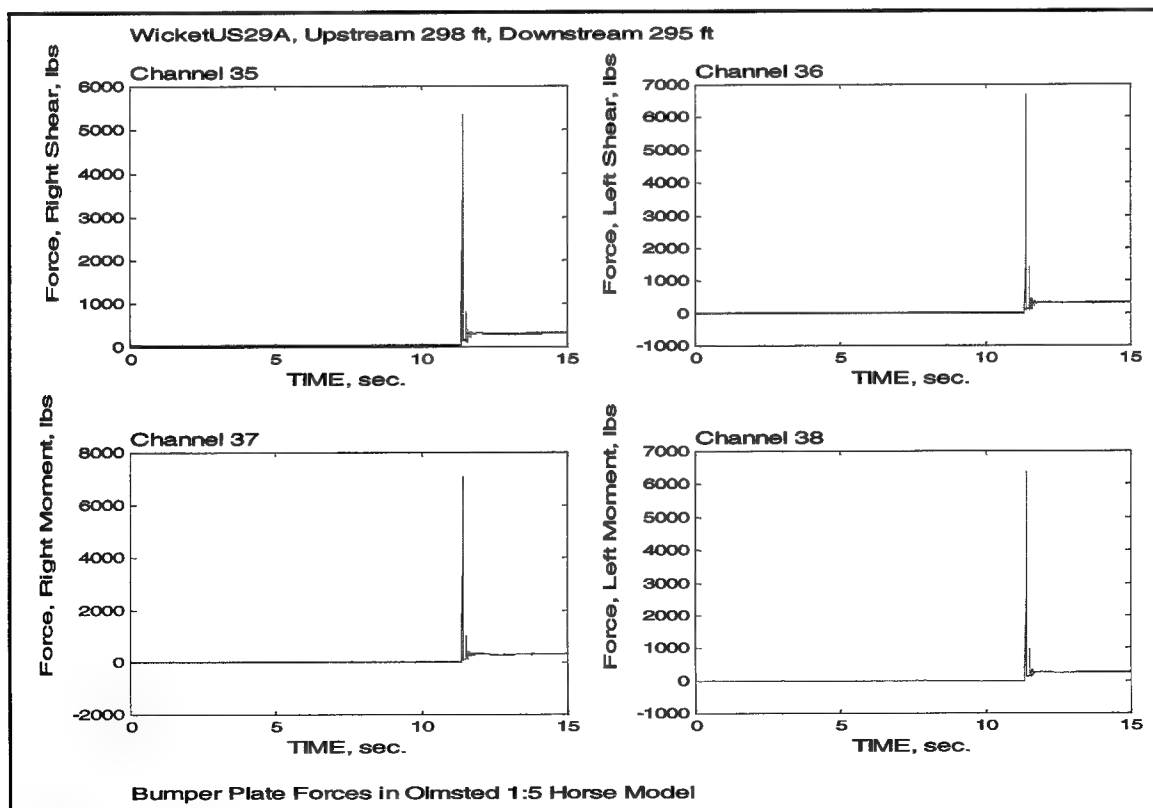


Figure C18. Bumper plate forces-Bottom-lift drop test-no gap (WicketUS29A)

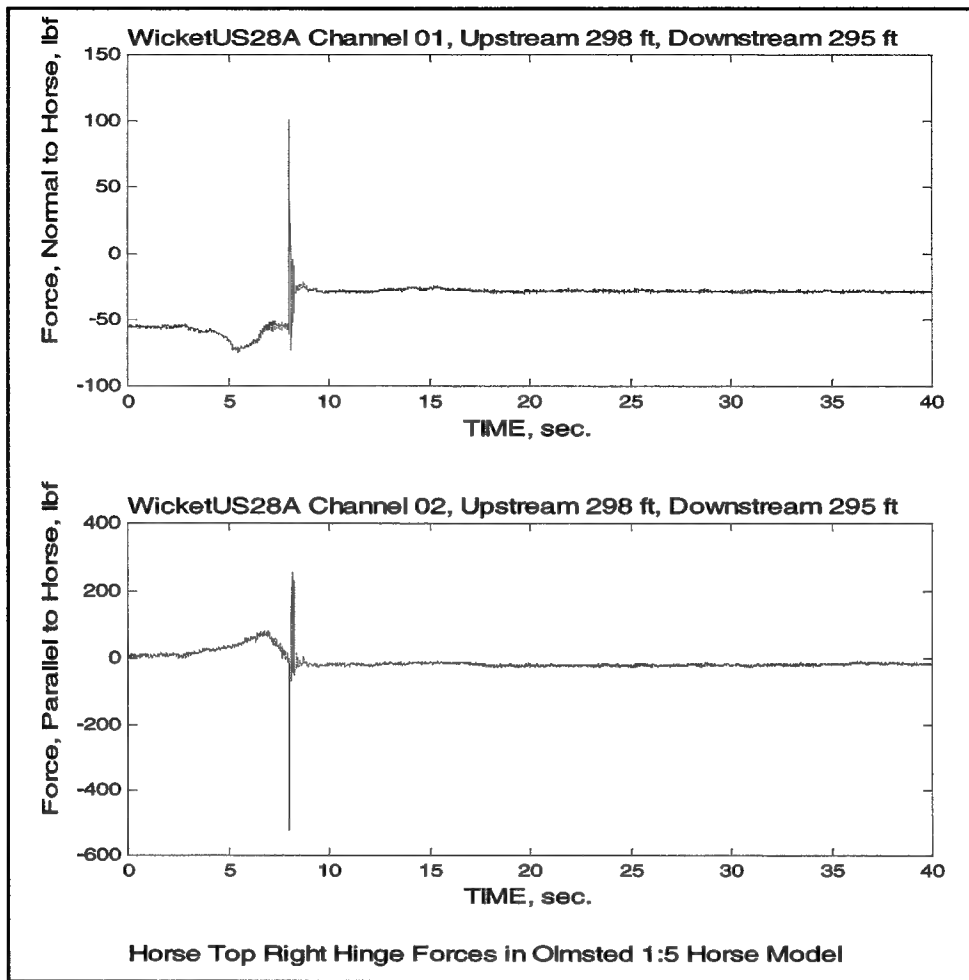


Figure C19. Horse bottom right hinge forces-Bottom-lift drop test-no gap (WicketUS29A)

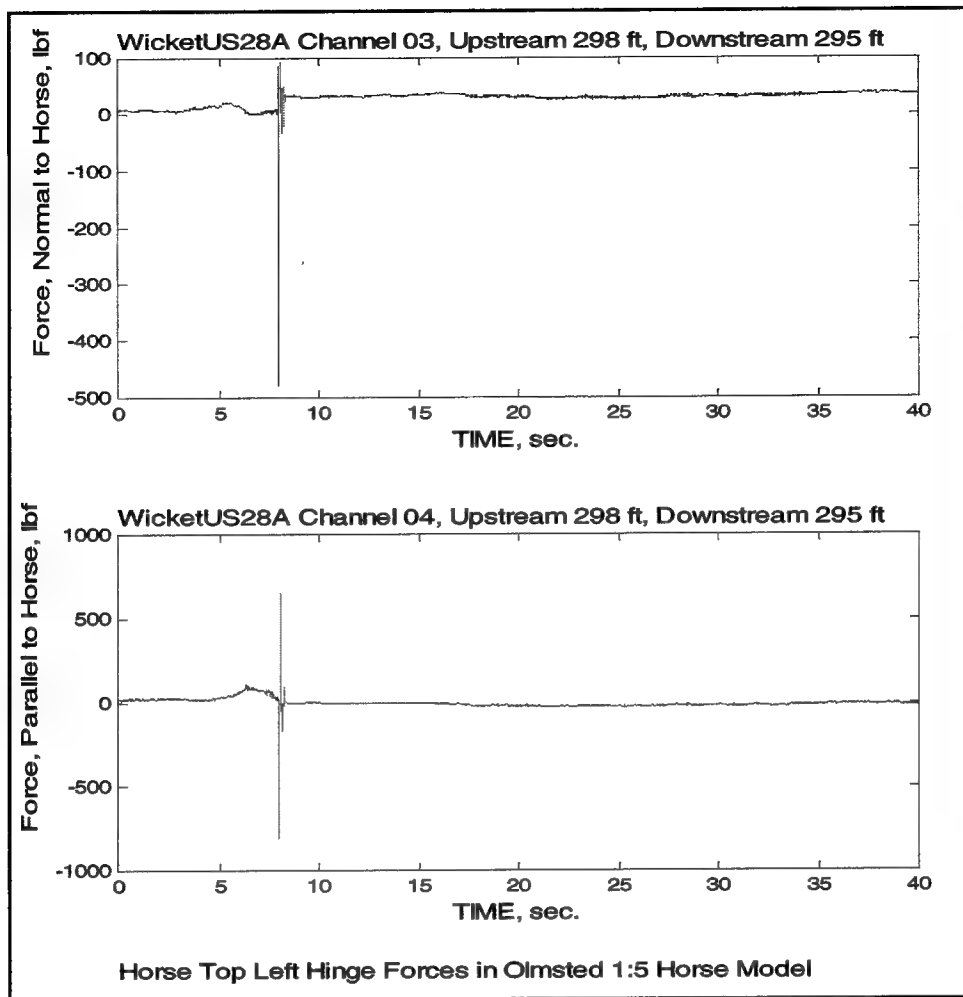


Figure C20. Horse bottom left hinge forces-Bottom-lift drop test-no gap (WicketUS29A)

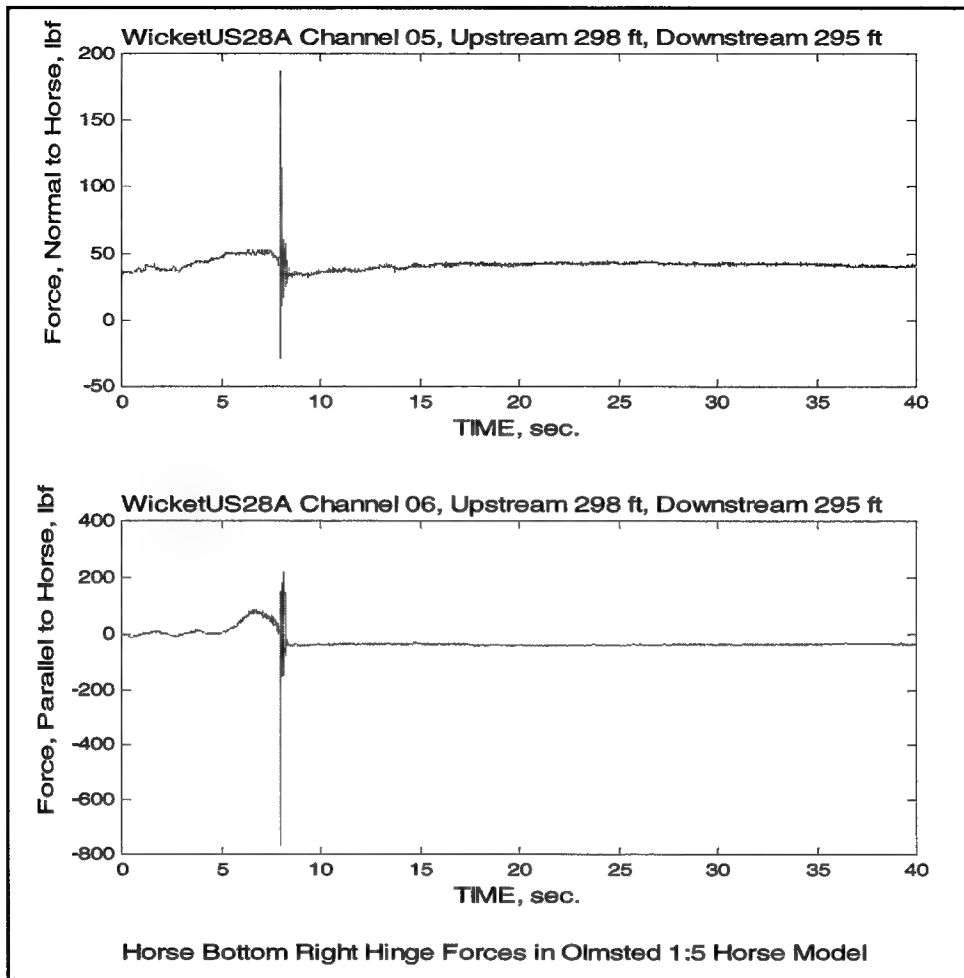


Figure C21. Horse bottom right hinge forces-Bottom-lift drop test-no gap (WicketUS28A)

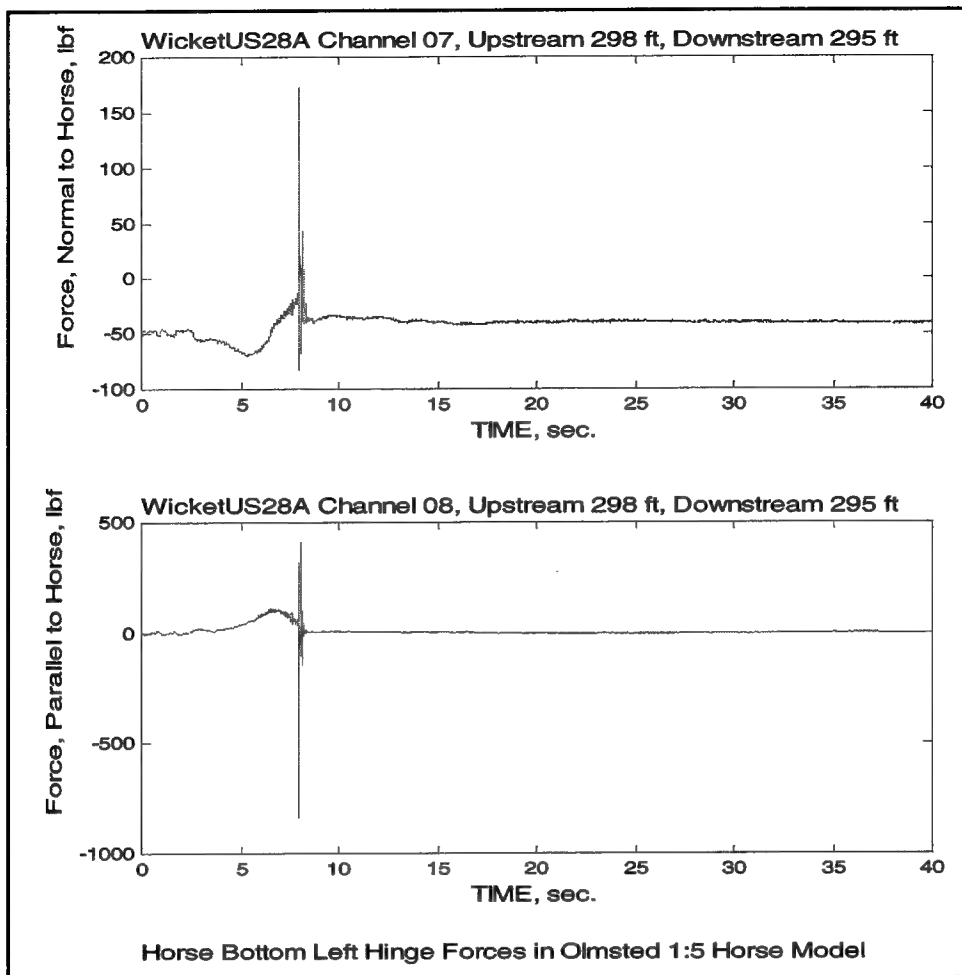


Figure C22. Horse bottom left hinge forces-Bottom-lift drop test-no gap (WicketUS28A)

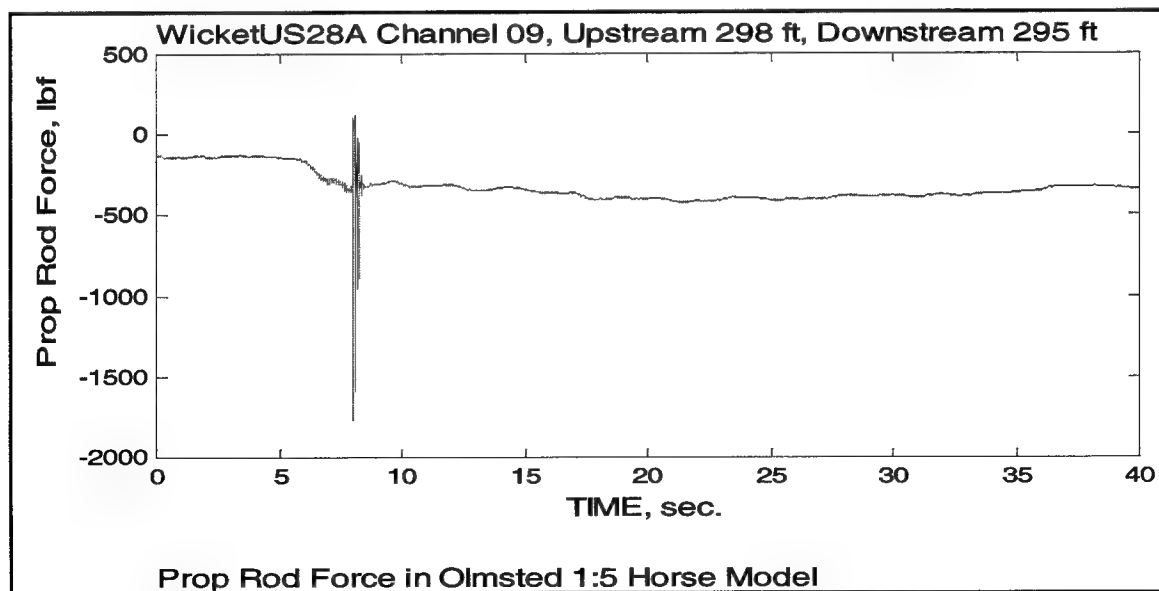


Figure C23. Prop rod force-Bottom-lift drop test-no gap (WicketUS28A)



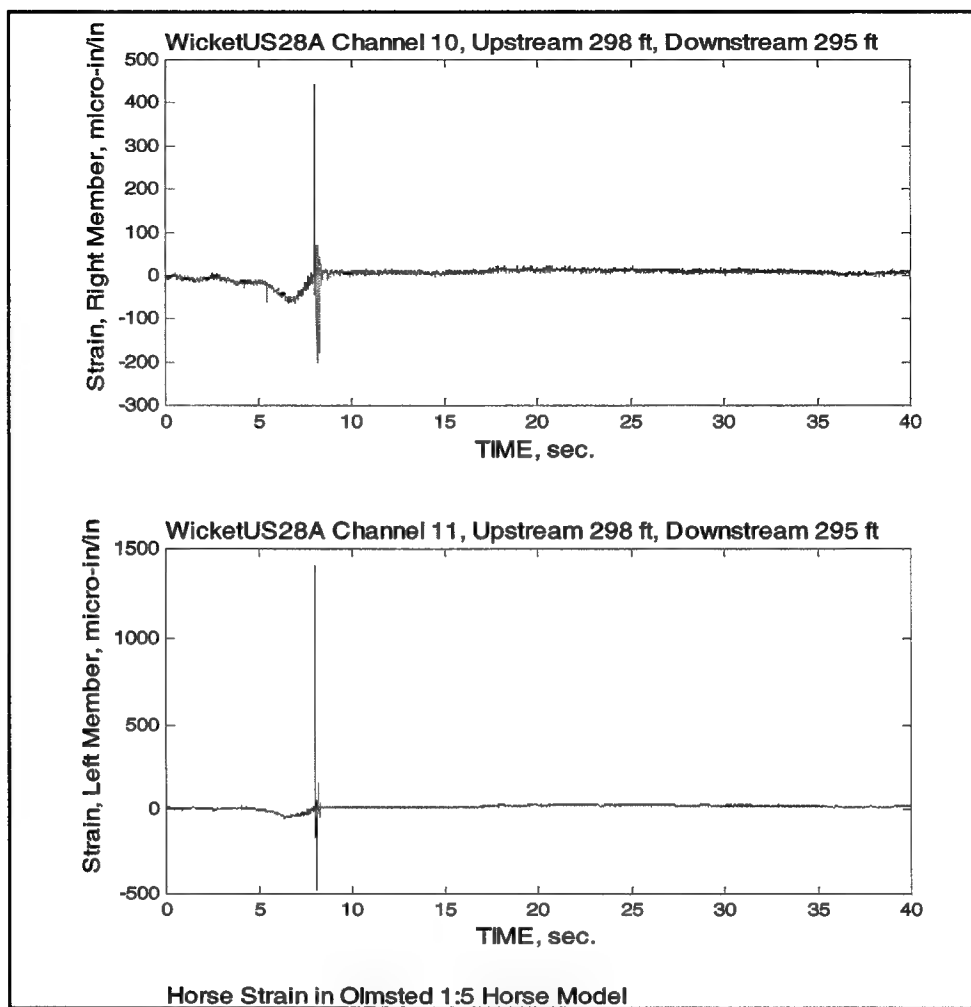


Figure C24. Horse strain-Bottom-lift drop test-no gap (WicketUS28A)

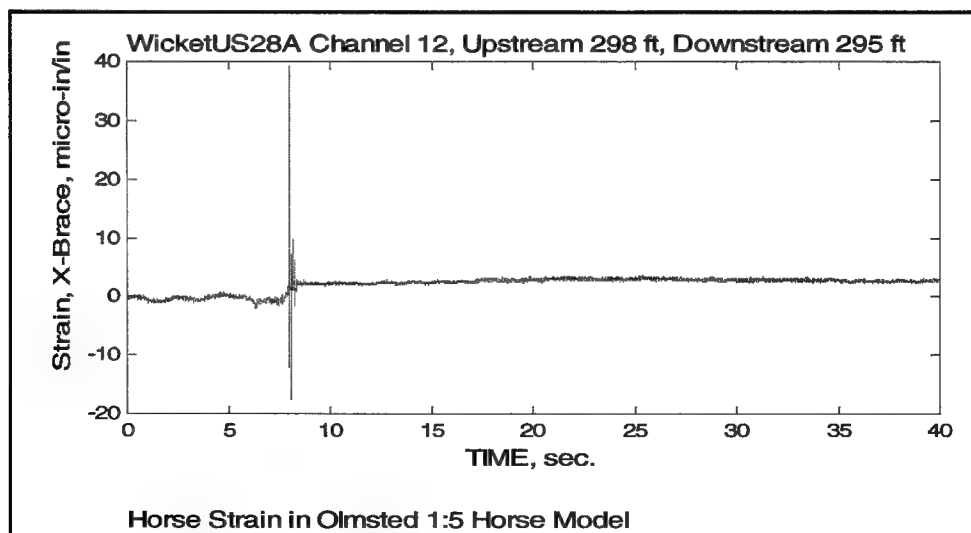


Figure C25. Horse strain-Bottom-lift drop test-no gap (WicketUS28A)

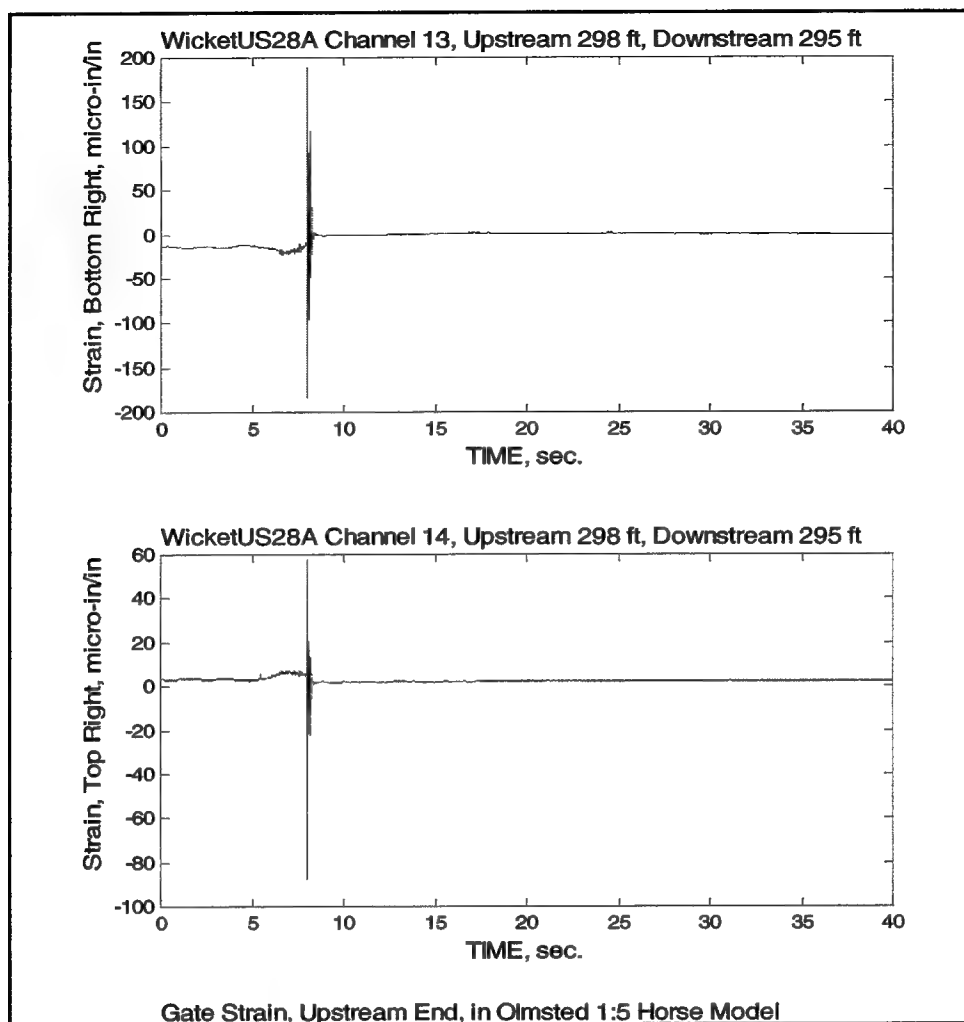


Figure C26. Gate strain, upstream end-Bottom-lift drop test-no gap (WicketUS28A)

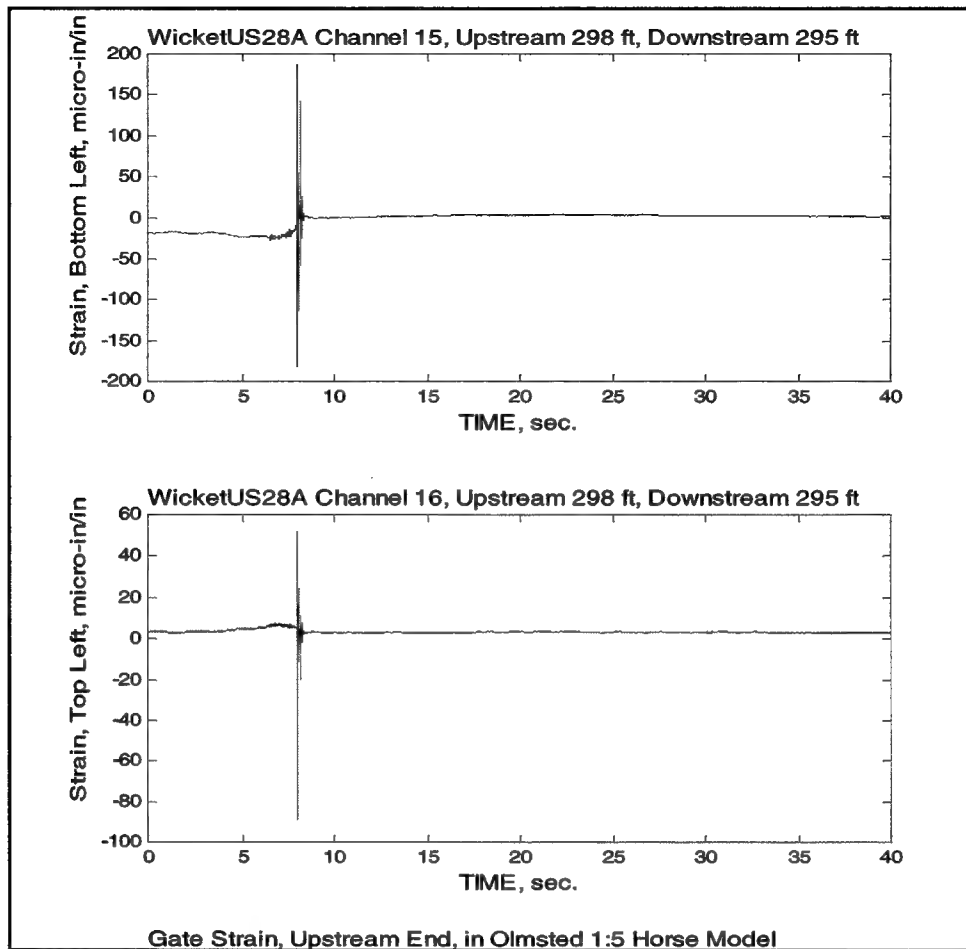


Figure C27. Gate strain, upstream end-Bottom-lift drop test-no gap (WicketUS28A)

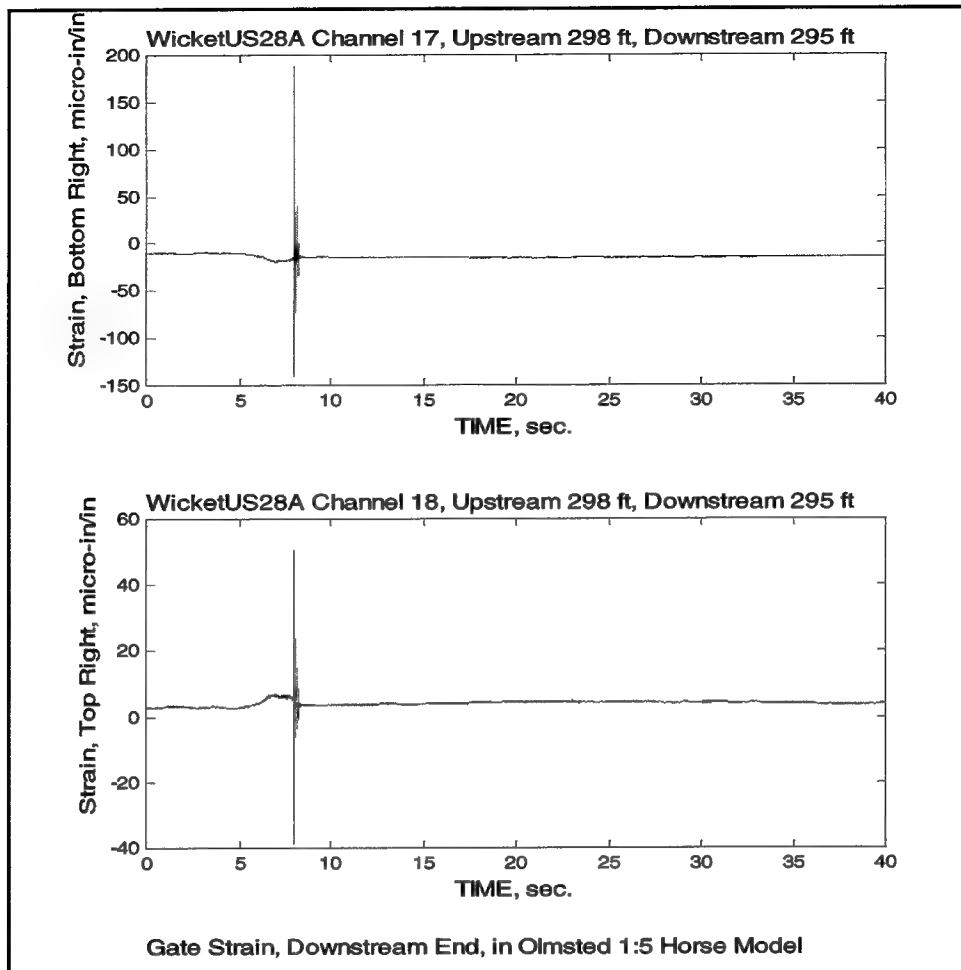


Figure C28. Gate strain, downstream end-Bottom-lift drop test-no gap (WicketUS28A)

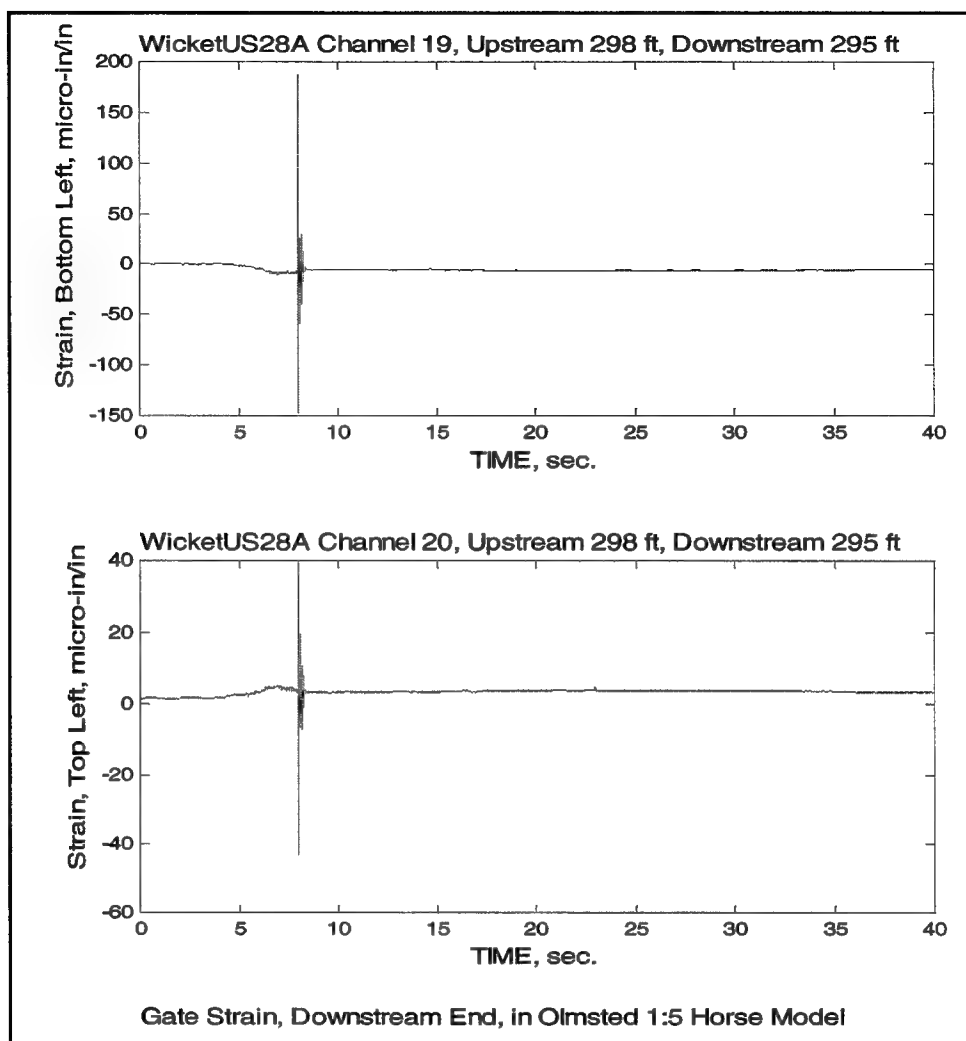


Figure C29. Gate strain-downstream end-Bottom-lift drop test-no gap (WicketUS28A)

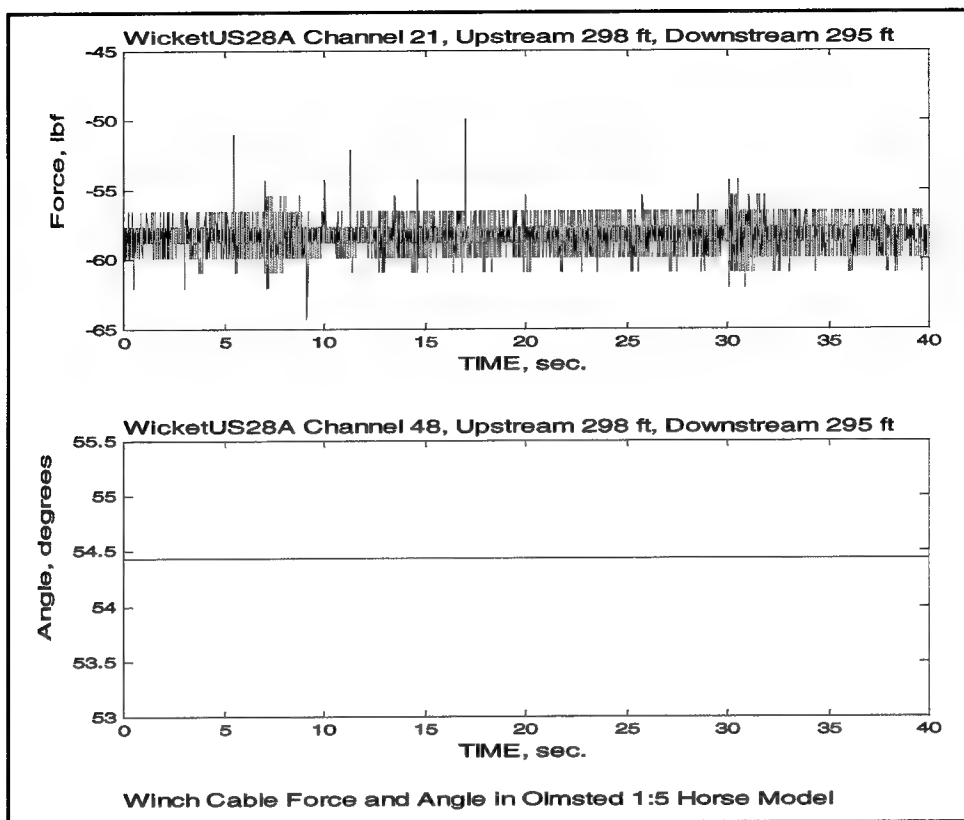


Figure C30. Winch cable force and angle-Bottom-lift drop test-no gap (WicketUS28A)

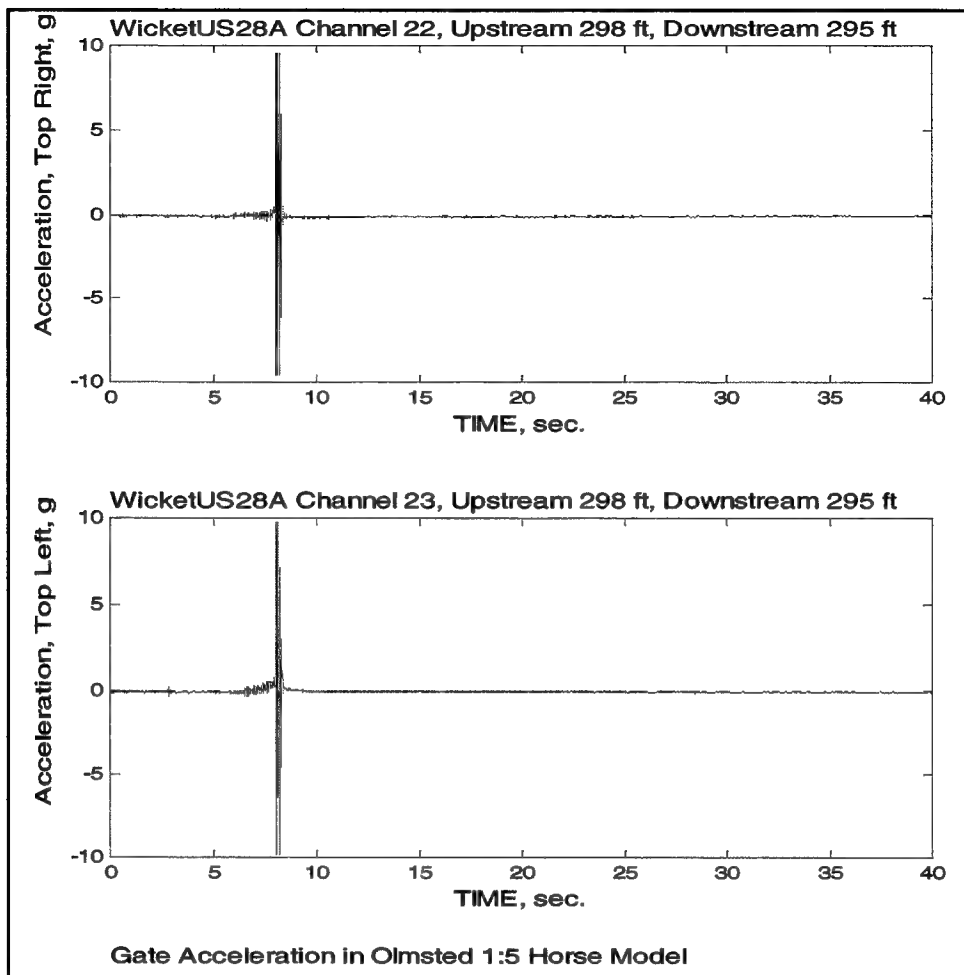


Figure C31. Gate acceleration-Bottom-lift drop test-no gap (WicketUS28A)

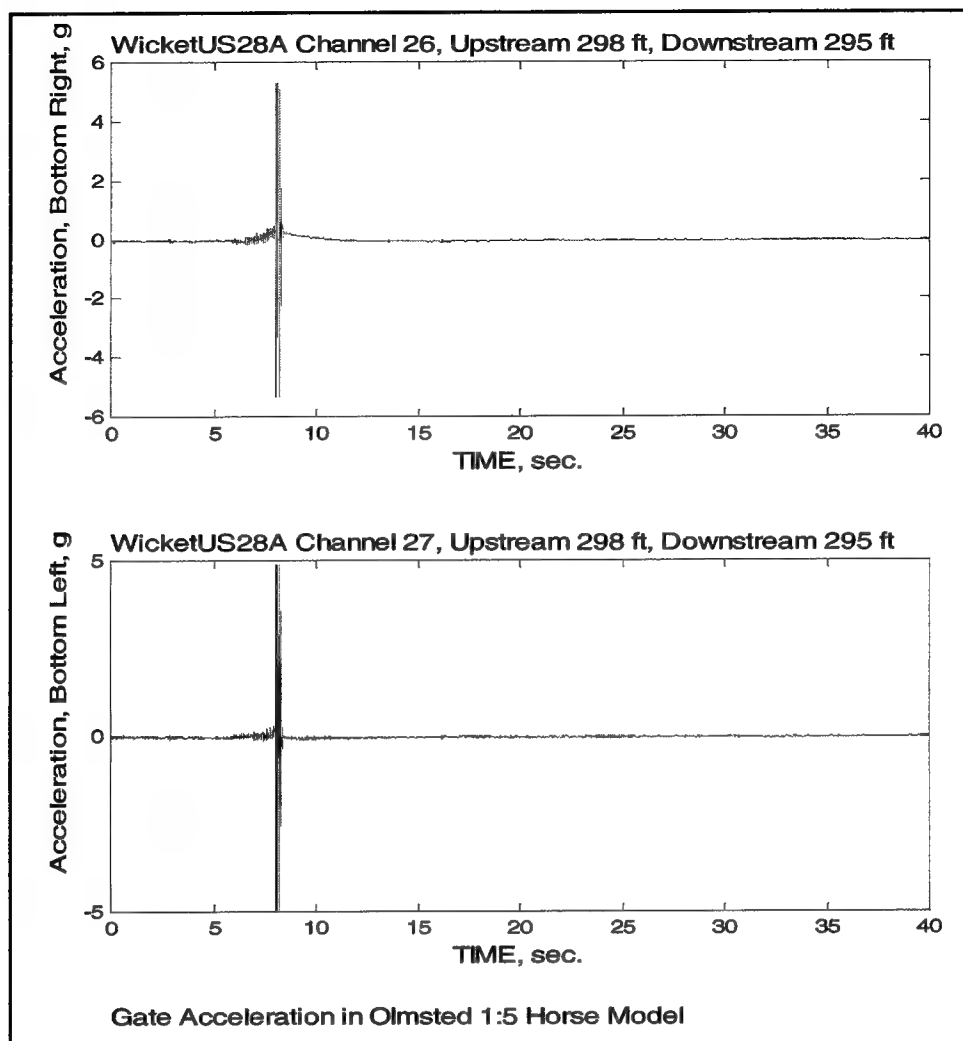


Figure C32. Gate acceleration-Bottom-lift drop test-no gap (WicketUS28A)



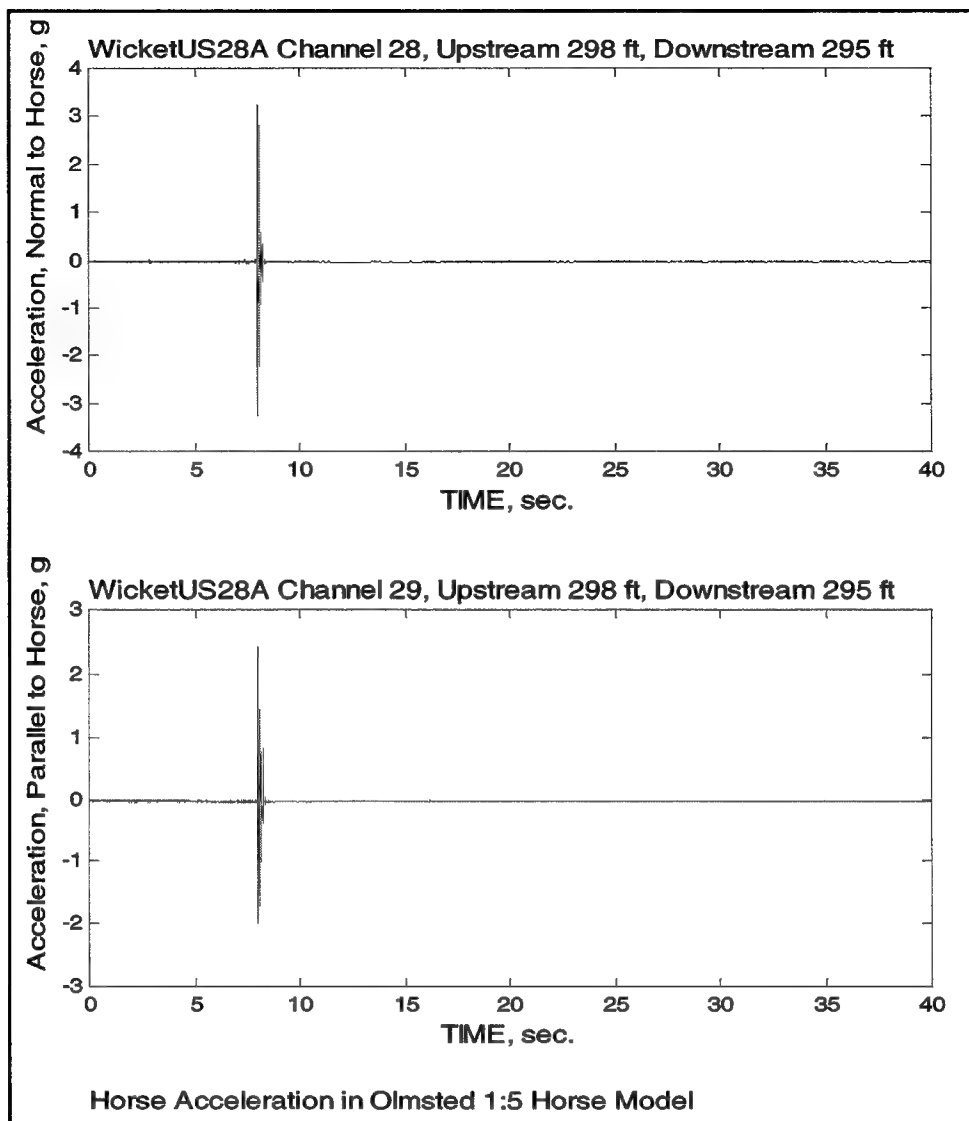


Figure C33. Horse acceleration-Bottom-lift drop test-no gap (WicketUS28A)

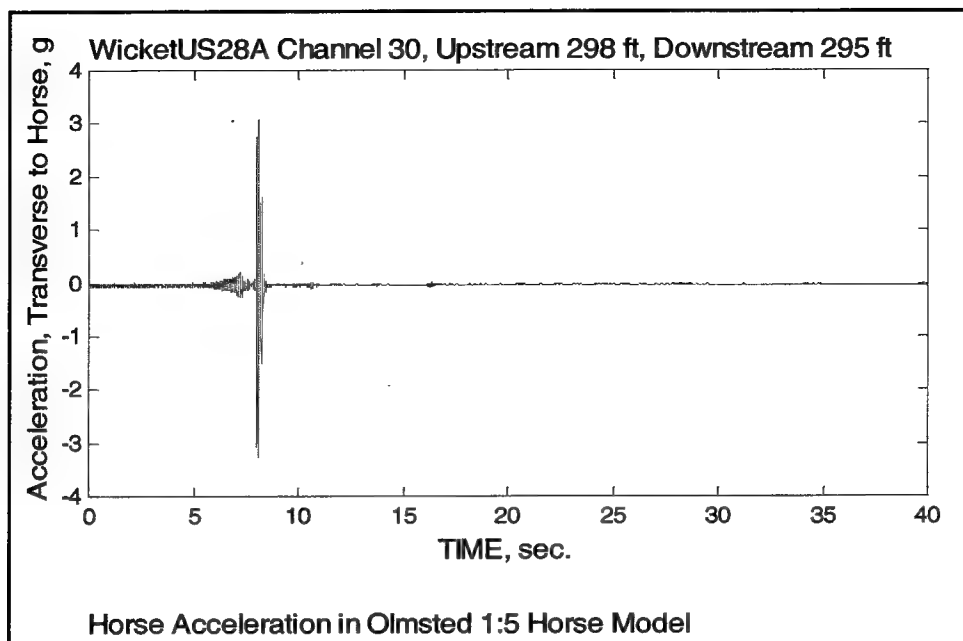


Figure C34. Horse acceleration-Bottom-lift drop test-no gap (WicketUS28A)

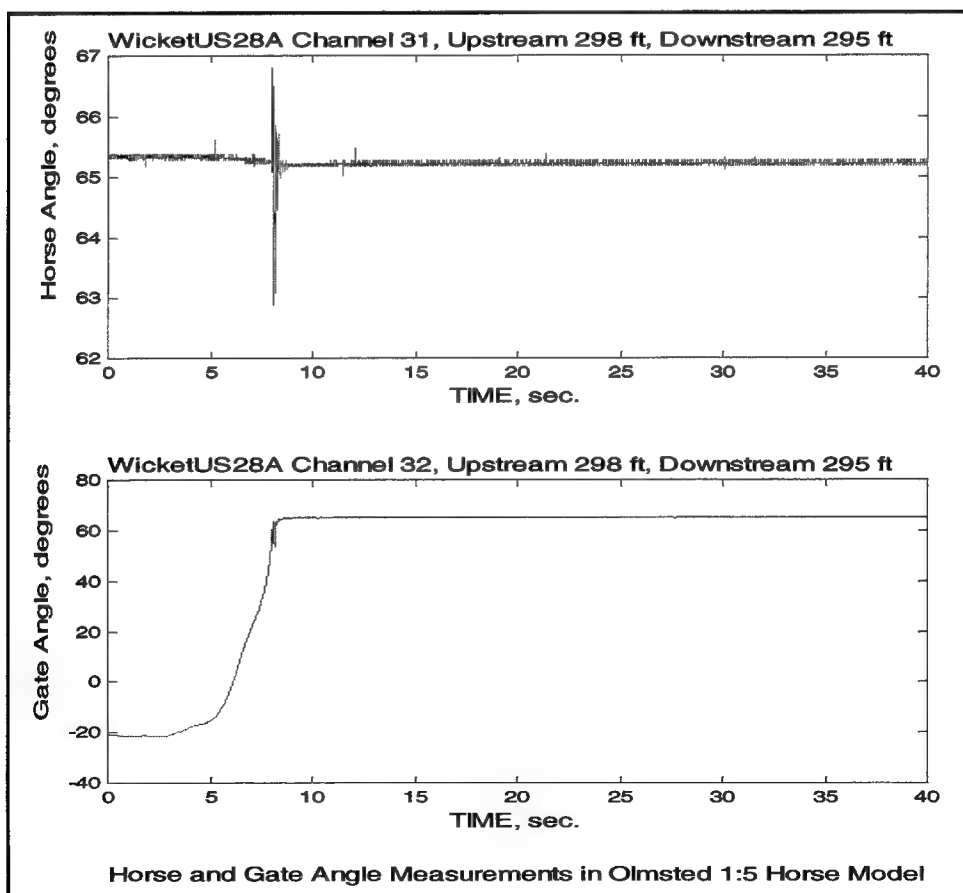


Figure C35. Horse and gate angle measurements-Bottom-lift drop test-no gap (WicketUS28A)

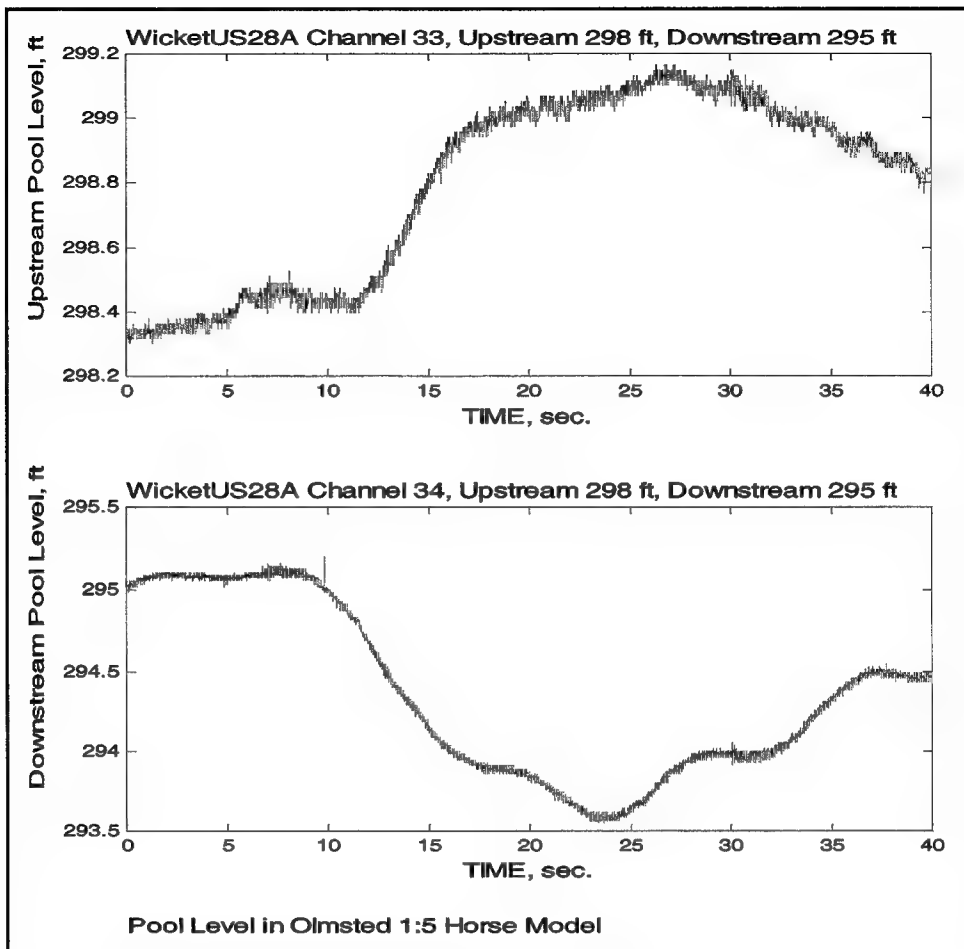


Figure C36. Pool level-Bottom-lift drop test-no gap (WicketUS28A)

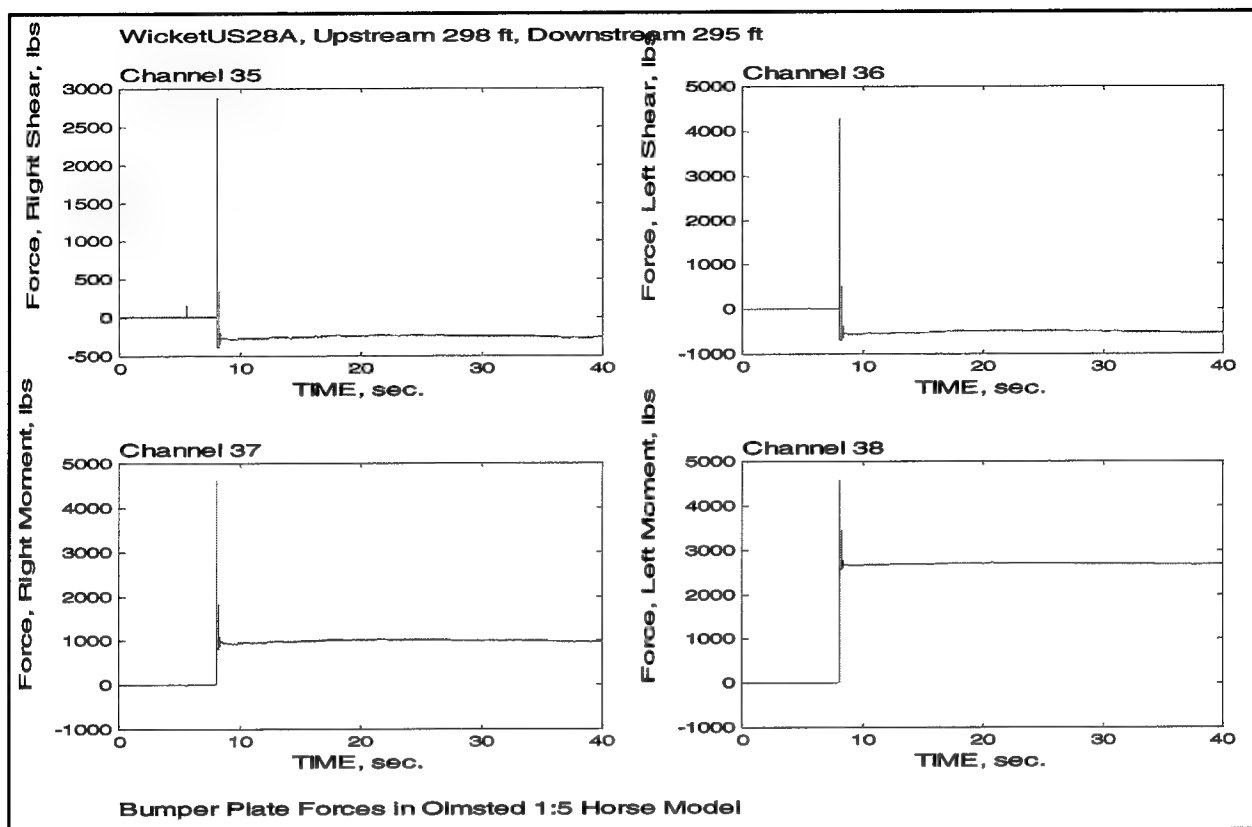


Figure C37. Bumper plate forces-Bottom-lift drop test-no gap (WicketUS28A)

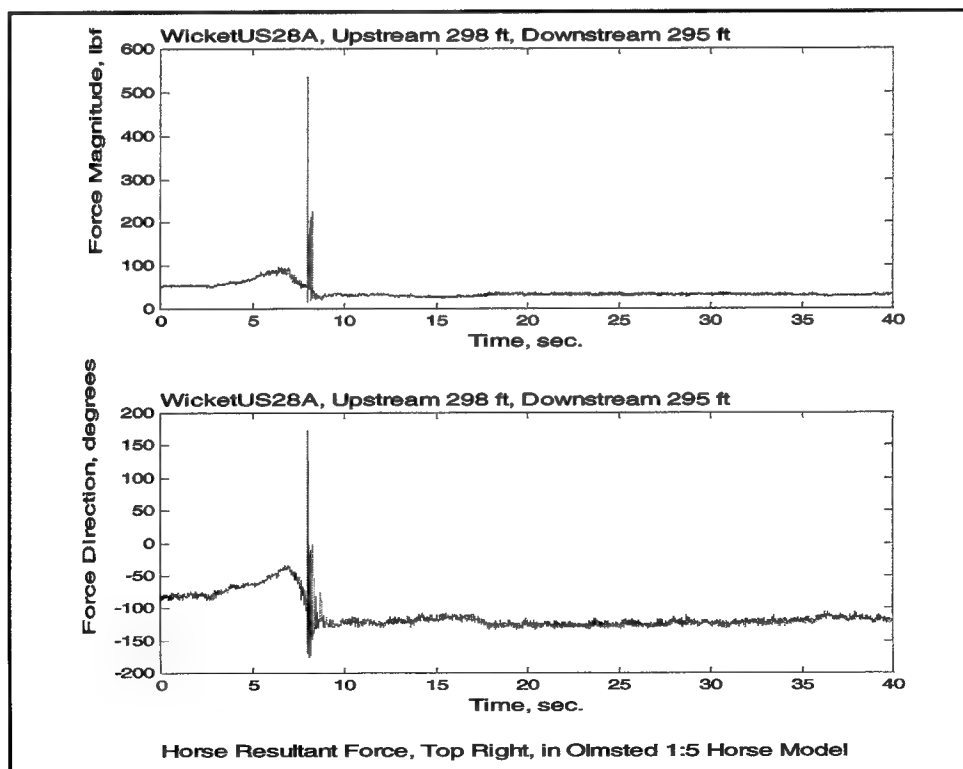


Figure C38. Horse resultant force, top right-Bottom-lift drop test-no gap (WicketUS28A)

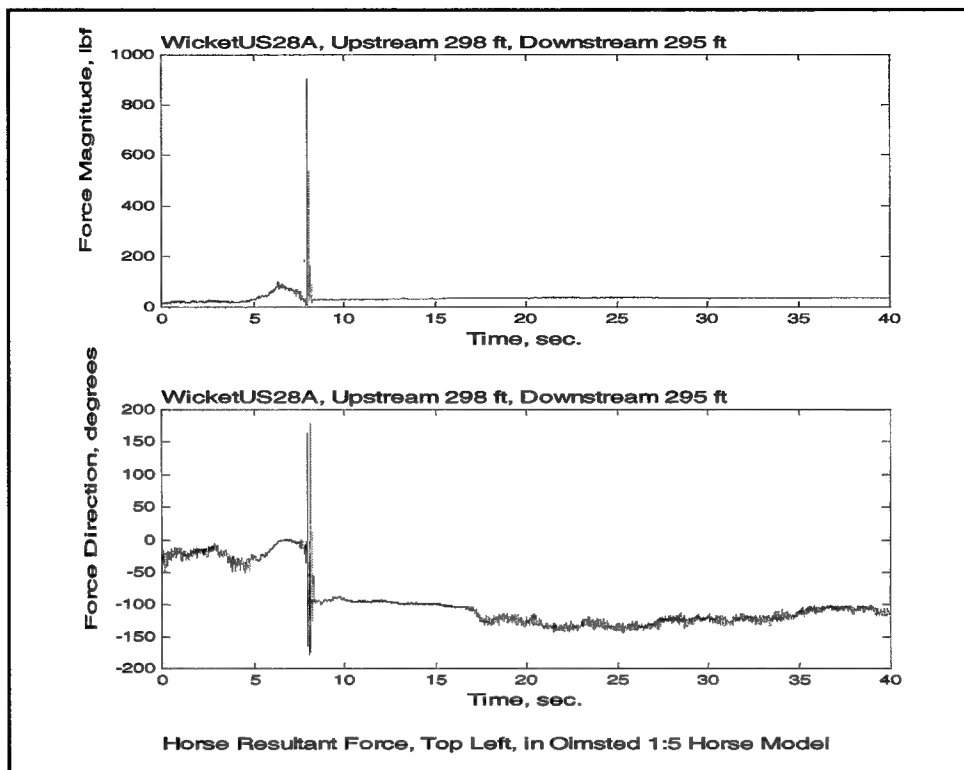


Figure C39. Horse resultant force, top left-Bottom-lift drop test- no gap (WicketUS28A)

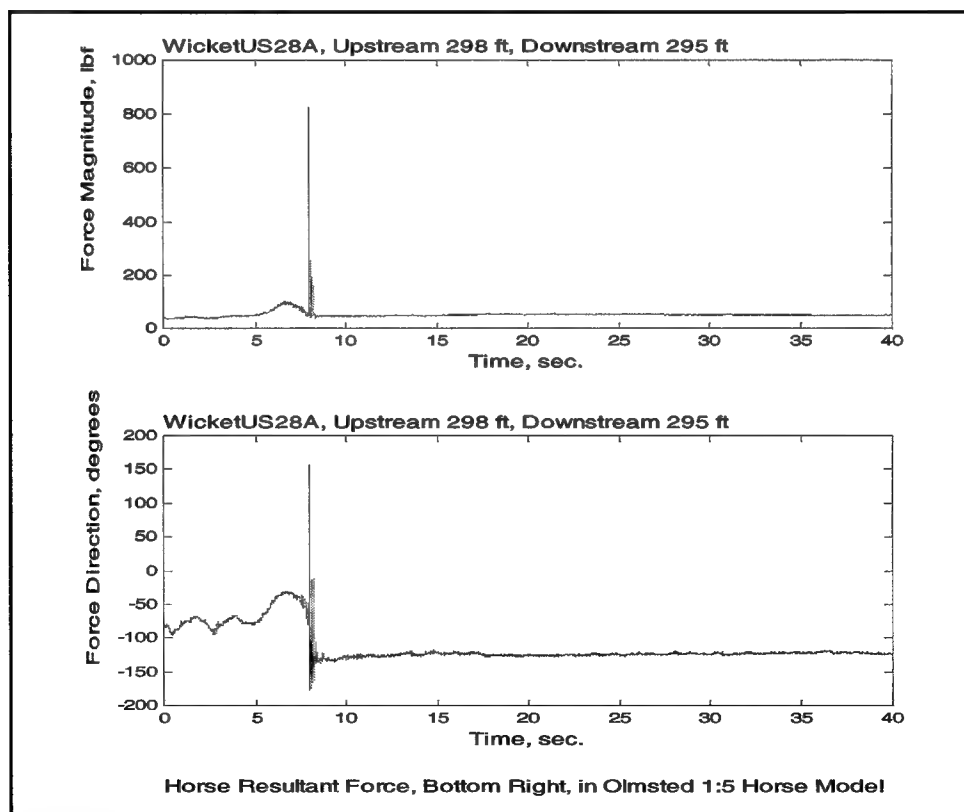


Figure C40. Horse resultant force, bottom right-Bottom-lift drop test-no gap (WicketUS28A)

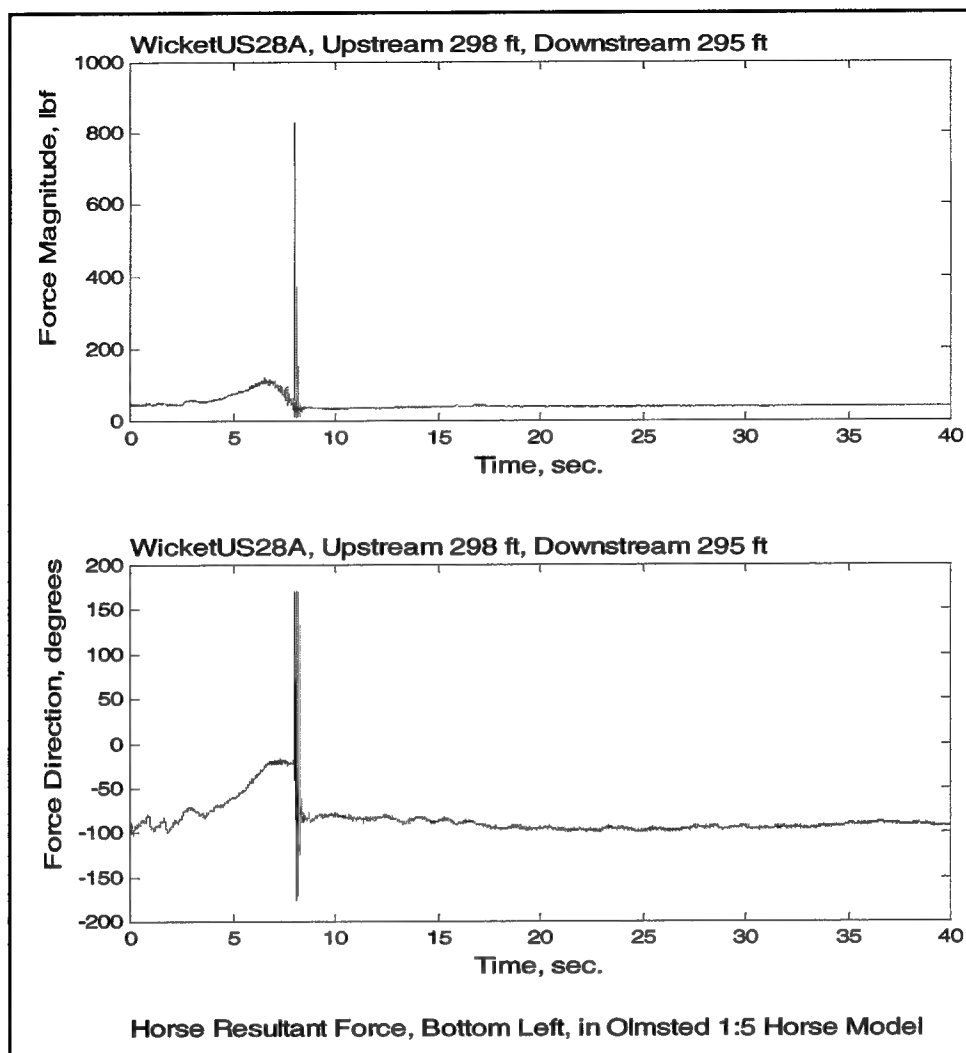


Figure C41. Horse resultant force, bottom left-Bottom-lift drop test-no gap (WicketUS28A)

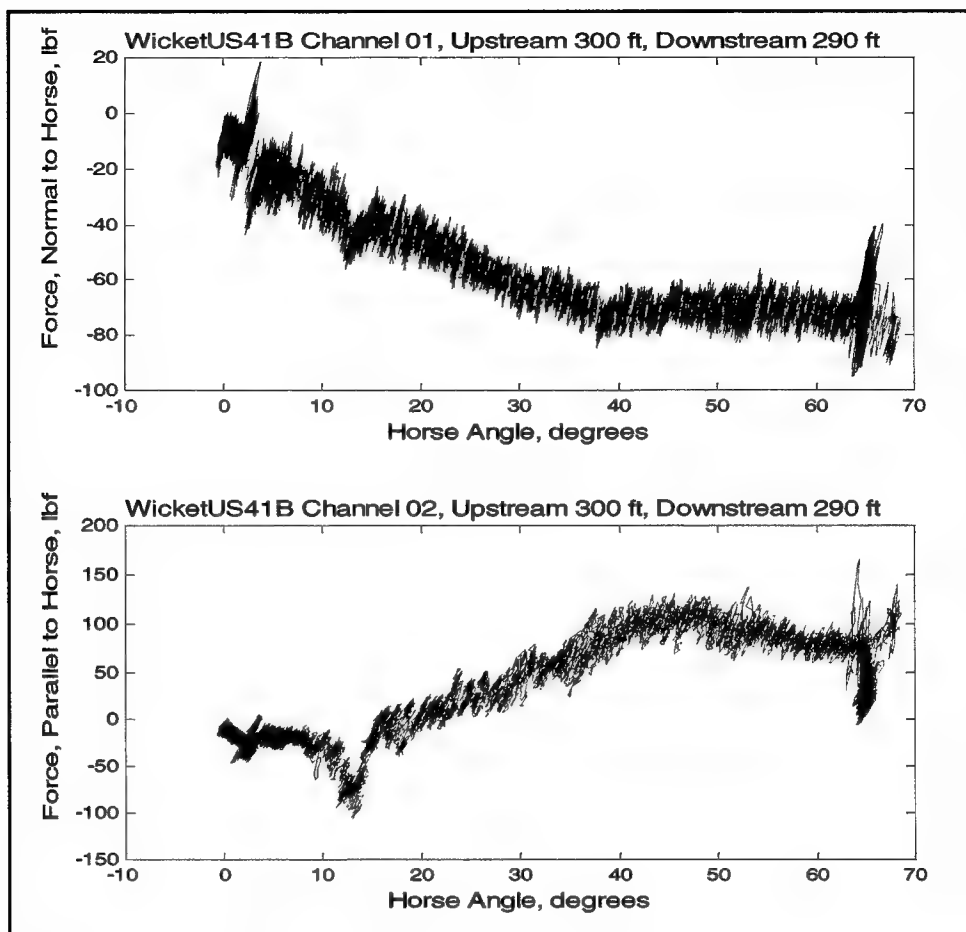


Figure C42. Bottom-lift drop test-no gap (WicketUS41B)

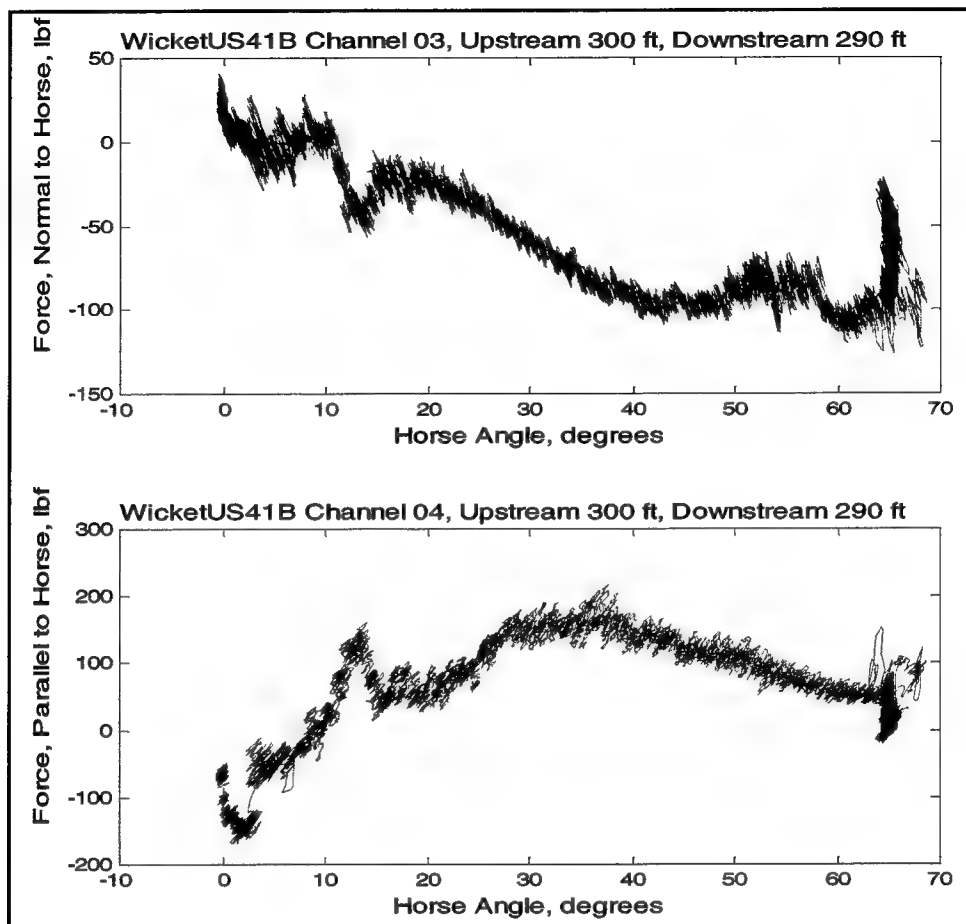


Figure C43. Bottom-lift drop test-no gap (WicketUS41B)



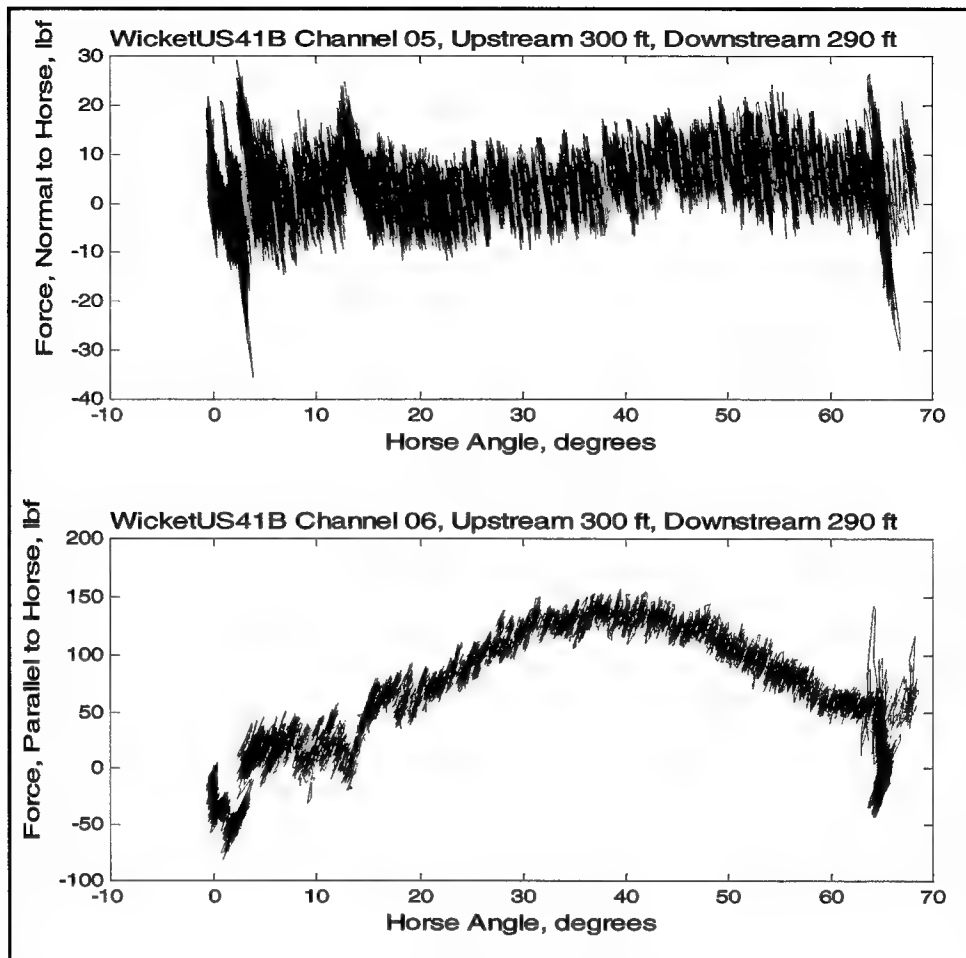


Figure C44. Bottom-lift drop test-no gap (WicketUS41B)

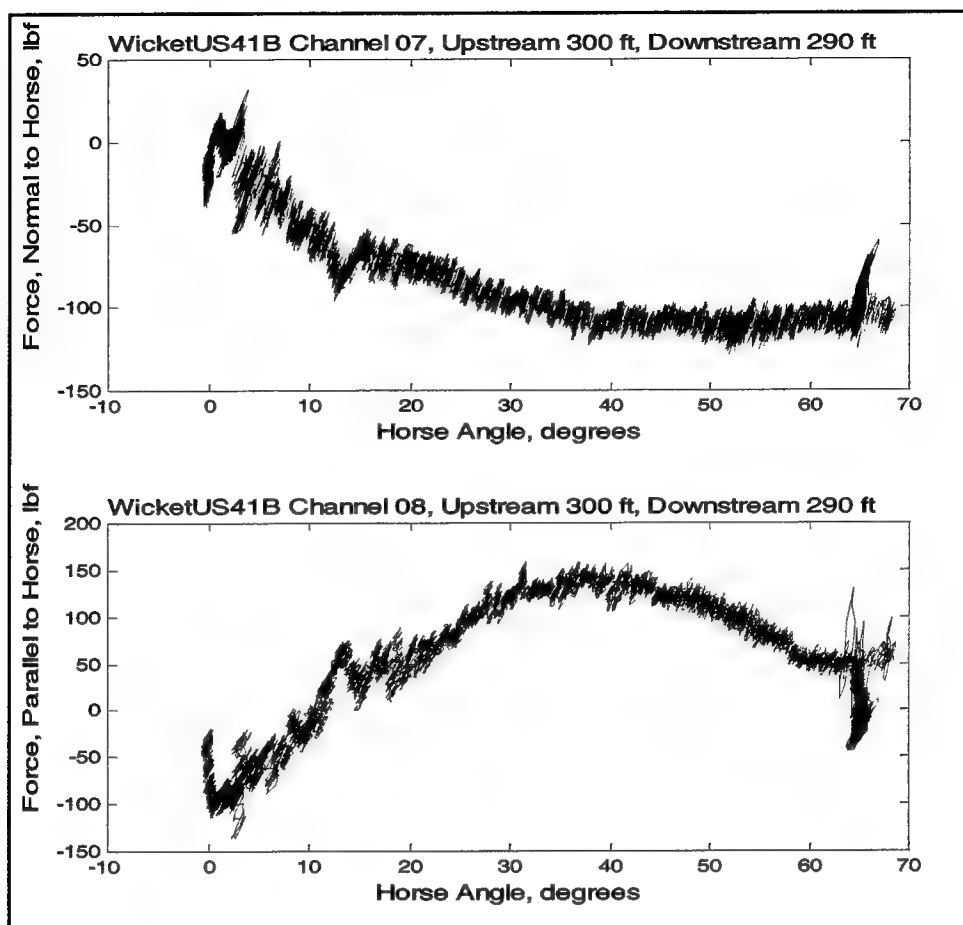


Figure C45. Bottom-lift drop test-no gap (WicketUS41B)

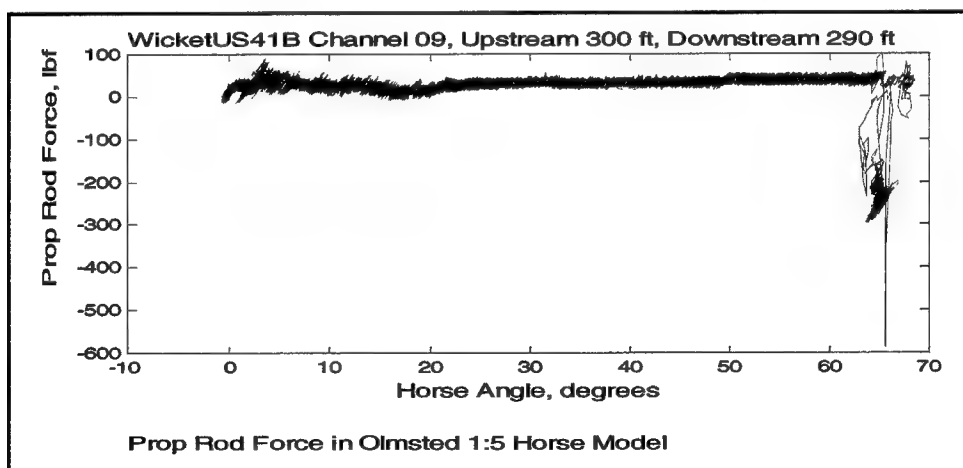


Figure C46. Prop rod force-Bottom-lift drop test-no gap (WicketUS41B)

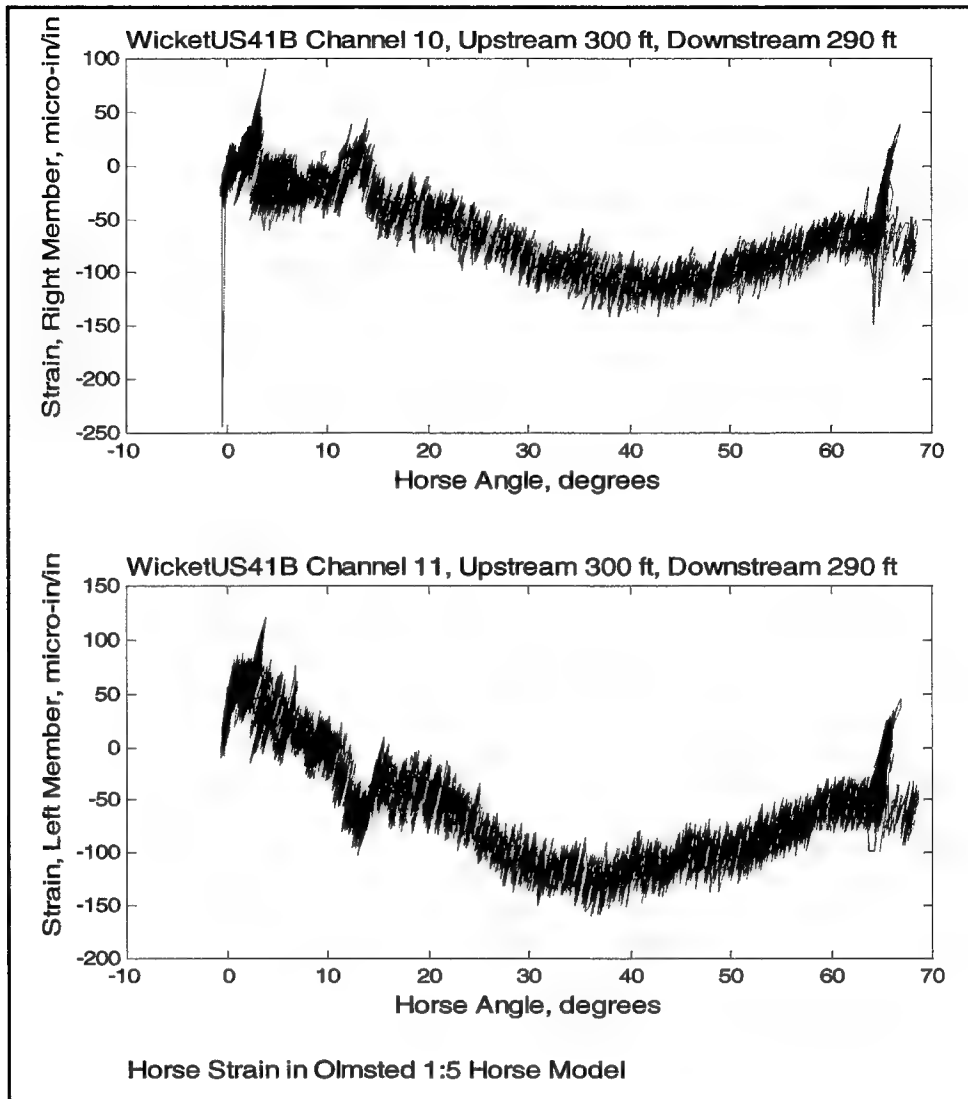


Figure C47. Horse strain-Bottom-lift drop test-no gap (WicketUS41B)

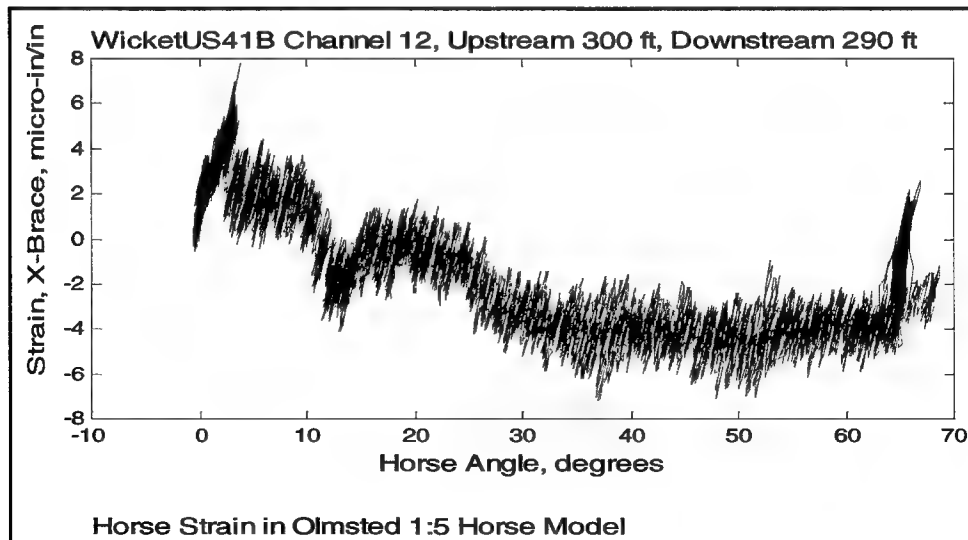


Figure C48. Horse strain-Bottom-lift drop test-no gap (WicketUS41B)

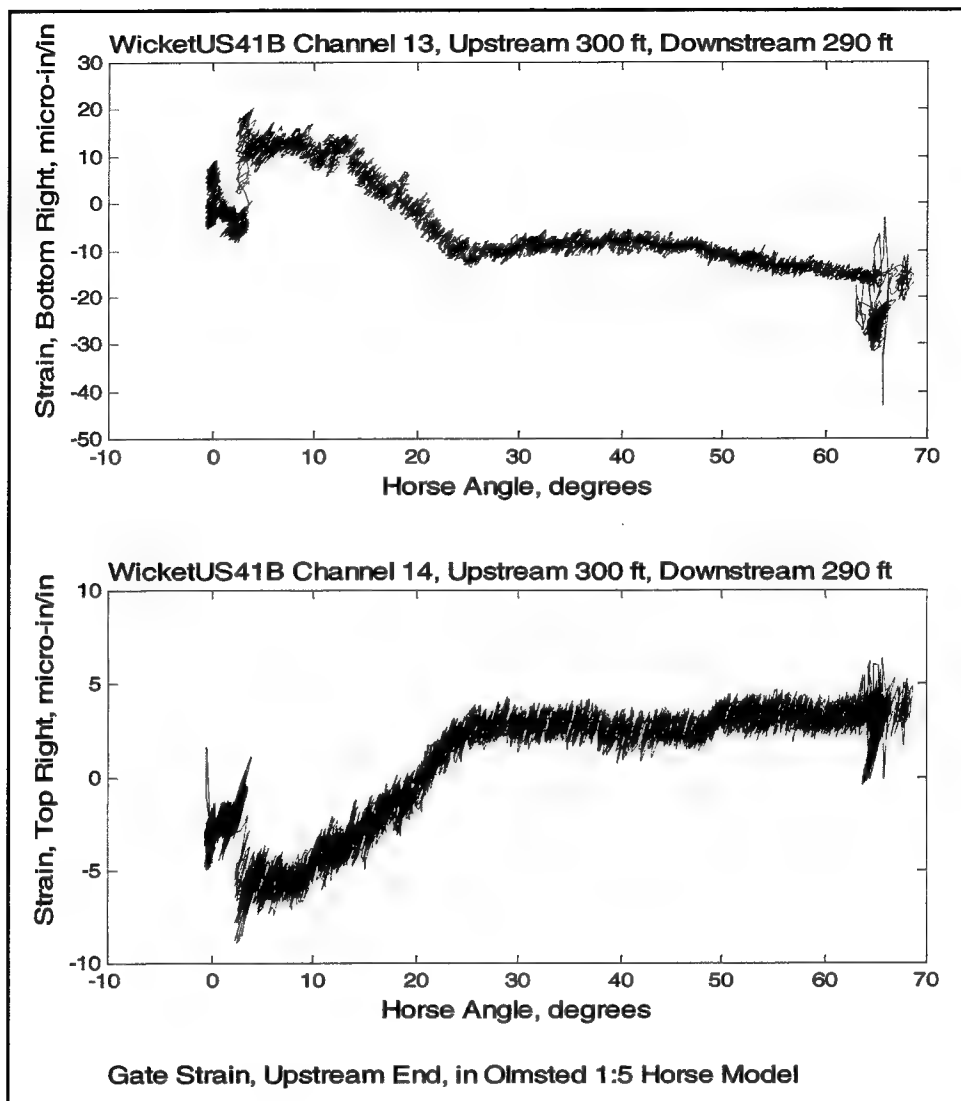


Figure C49. Gate strain, upstream end-Bottom-lift drop test-no gap (WicketUS41B)

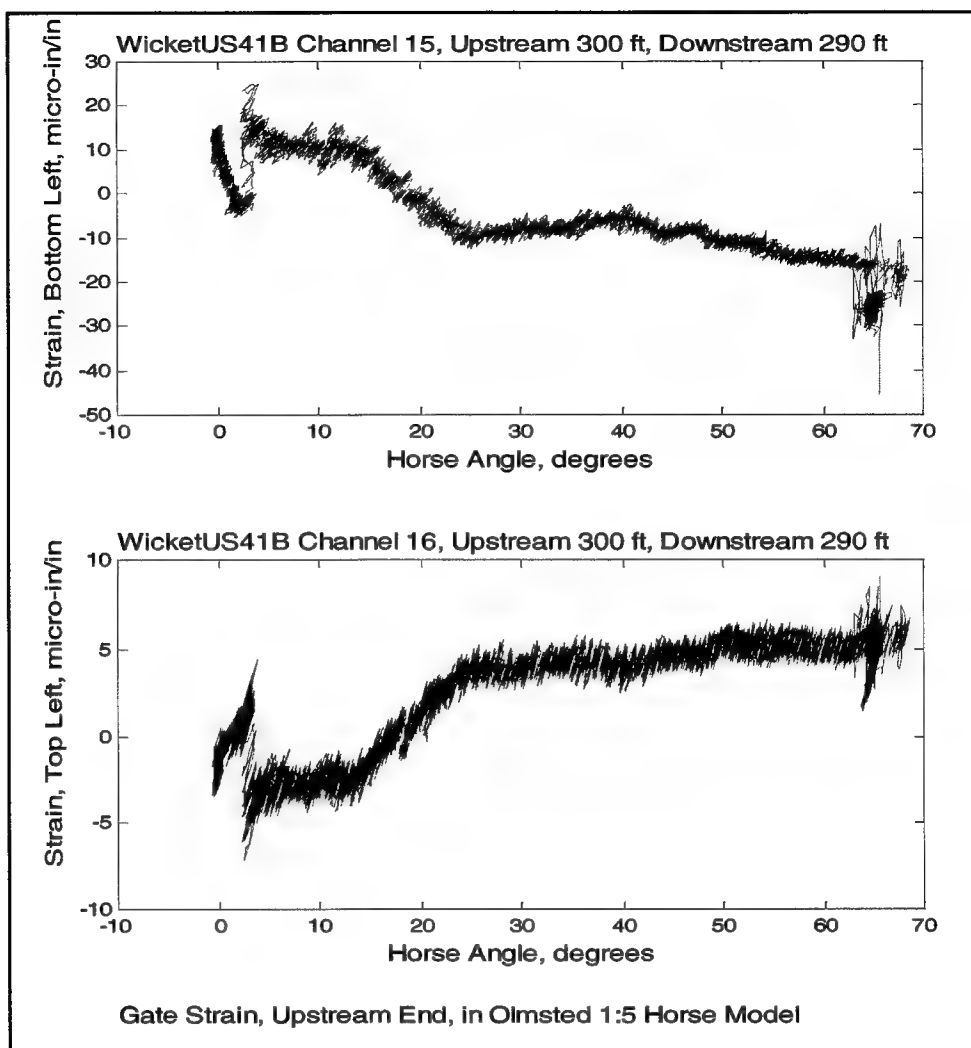


Figure C50. Gate strain, upstream end, Bottom-lift drop test-no gap (WicketUS41B)

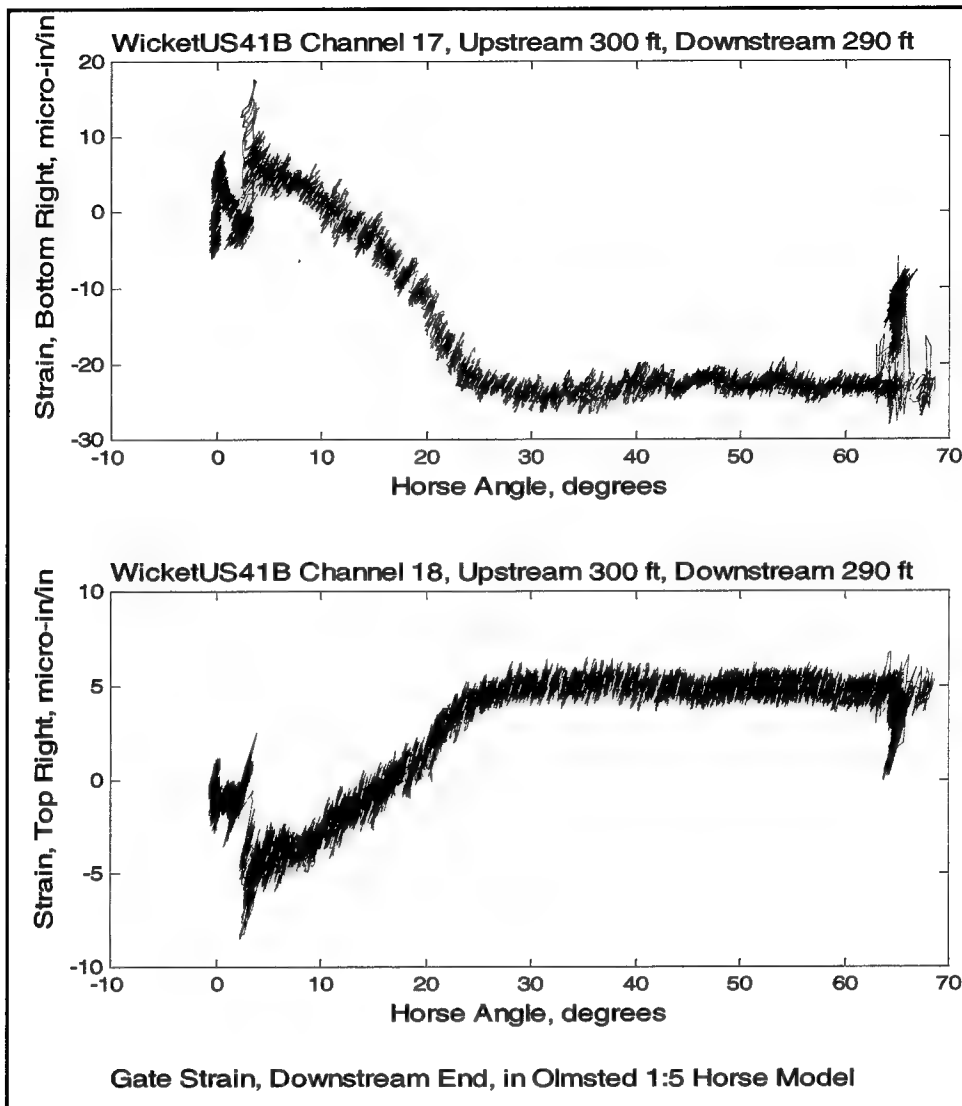


Figure C51. Gate strain, downstream end-Bottom-lift drop test-no gap (WicketUS41B)

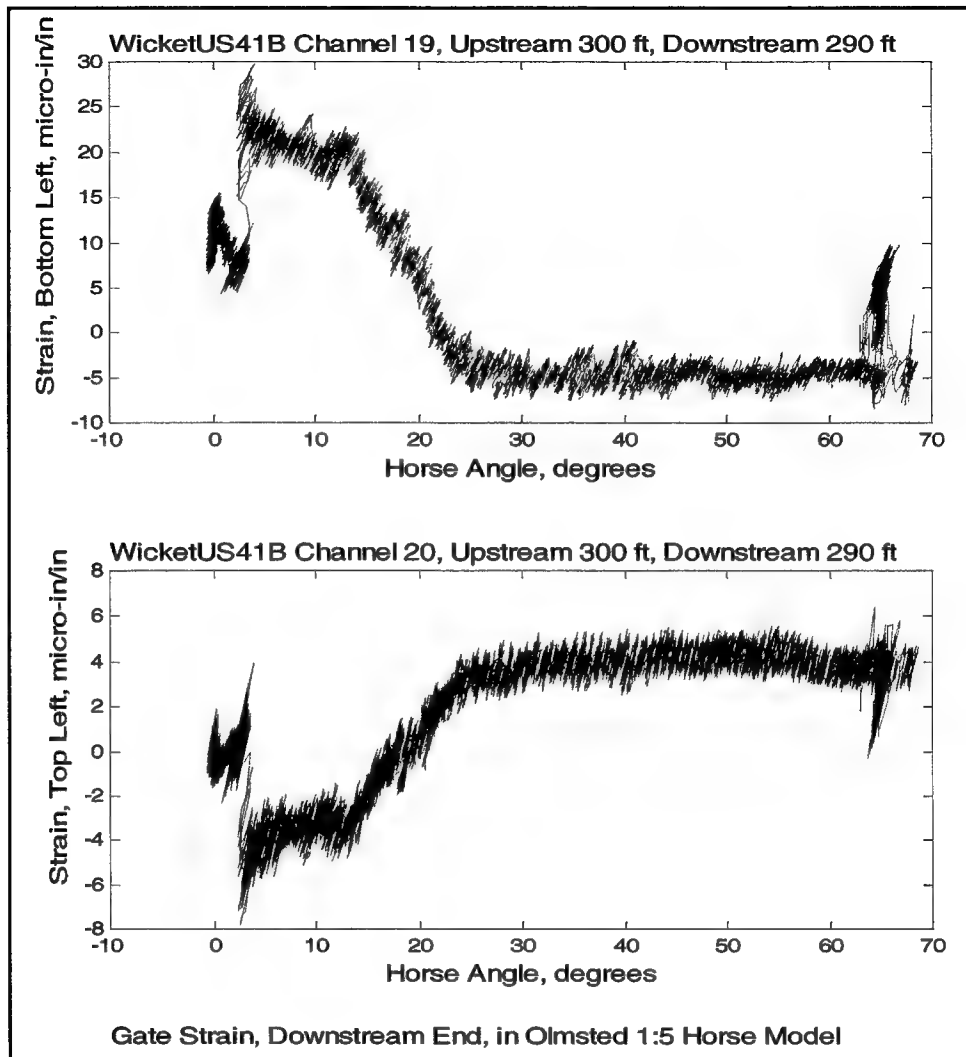


Figure C52. Gate strain, downstream end-Bottom-lift drop test-no gap (WicketUS41B)

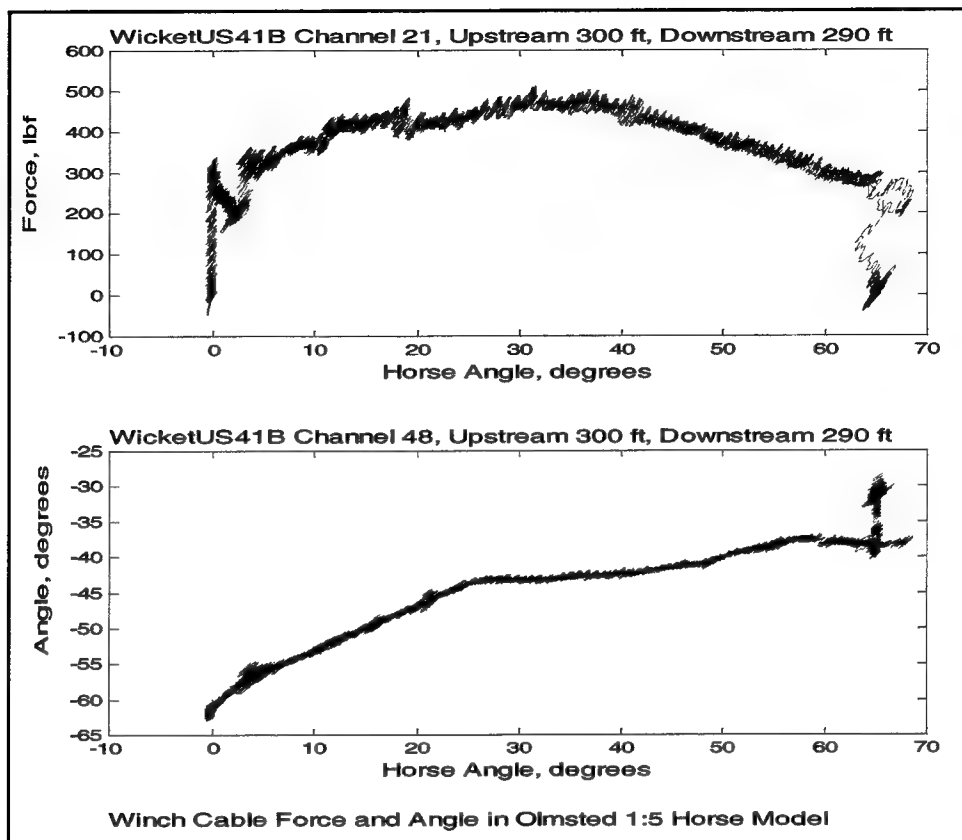


Figure C53. Winch cable force and angle-Bottom-lift drop test-no gap (WicketUS41B)

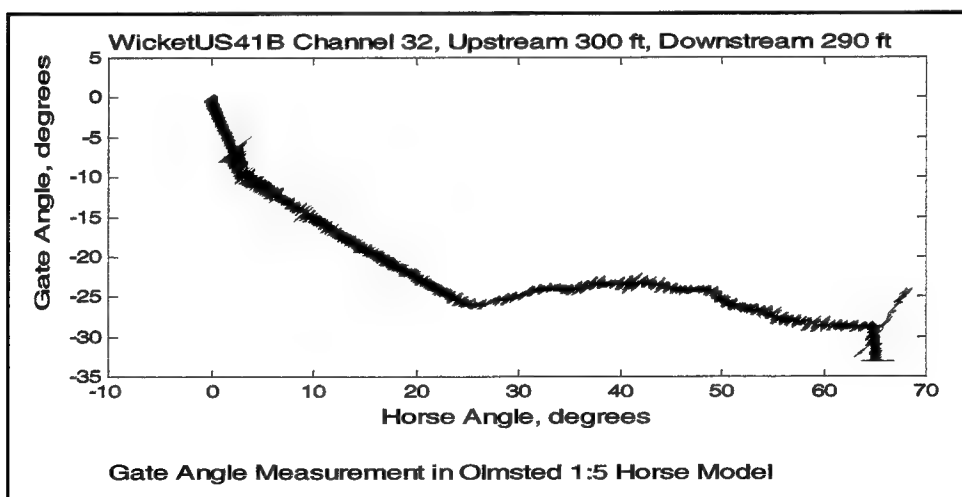


Figure C54. Gate angle measurement-Bottom-lift drop test-no gap (WicketUS41B)



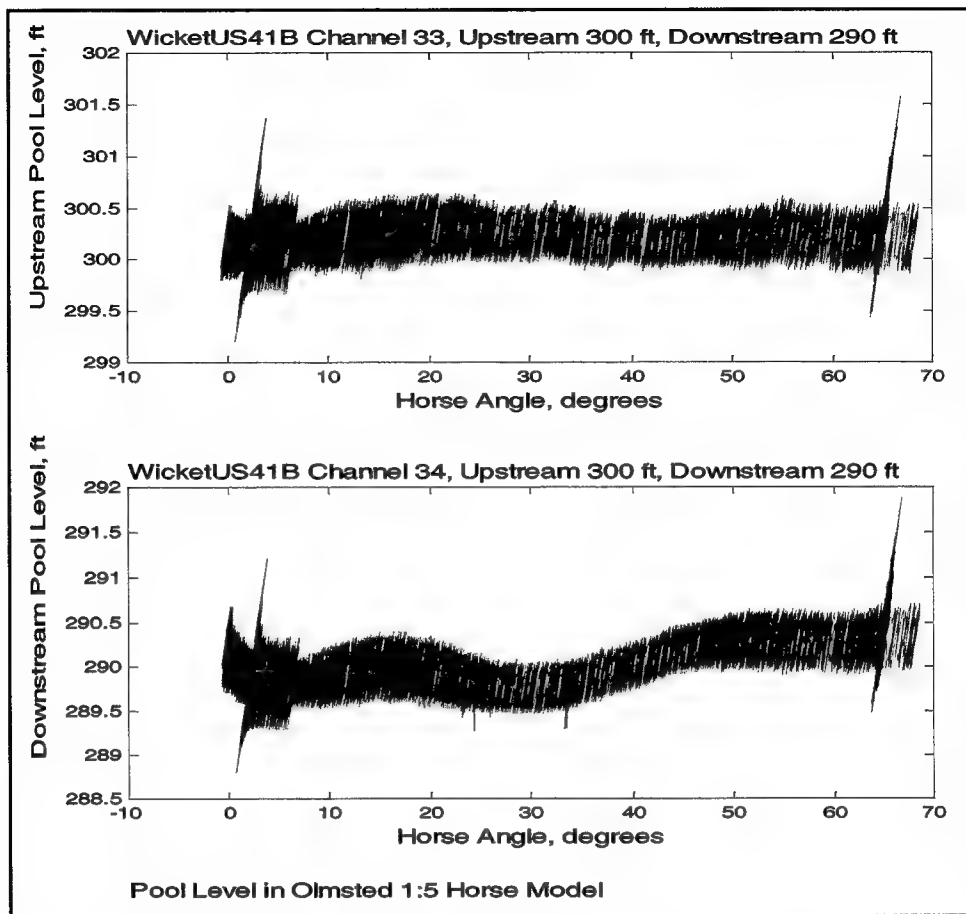


Figure C55. Pool level-Bottom-lift drop test-no gap (WicketUS41B)

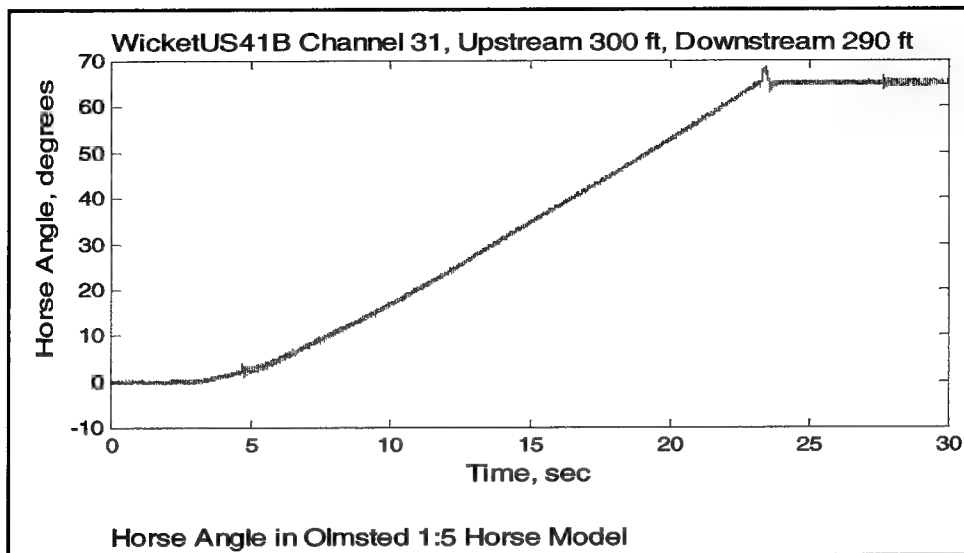


Figure C56. Horse angle-Bottom-lift drop test-no gap (WicketUS41B)

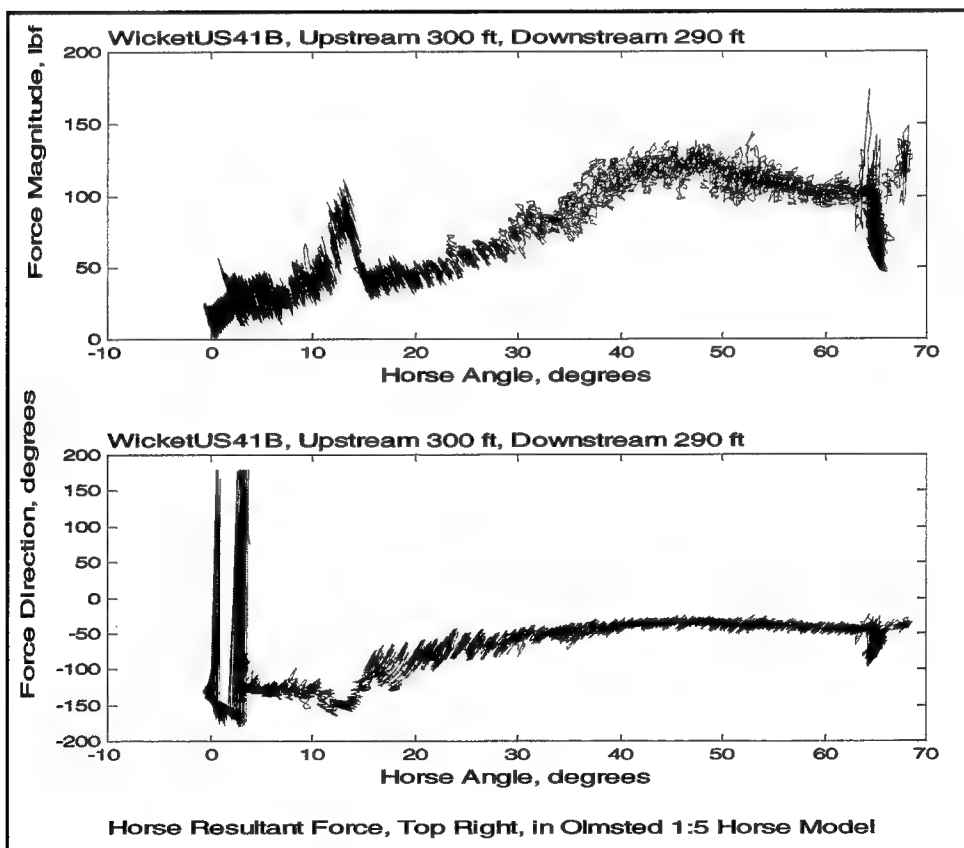


Figure C57. Horse resultant force, top right-Bottom-lift drop test-no gap (WicketUS41B)

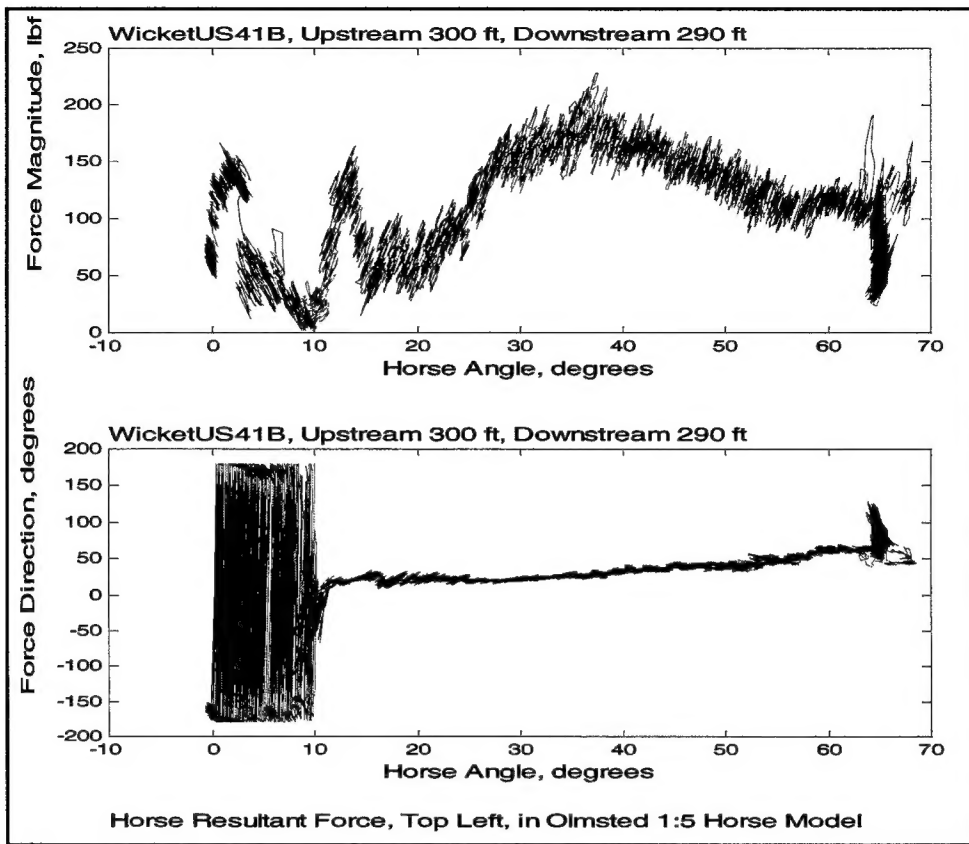


Figure C58. Horse resultant force, top left-Bottom-lift drop test-no gap (WicketUS41B)

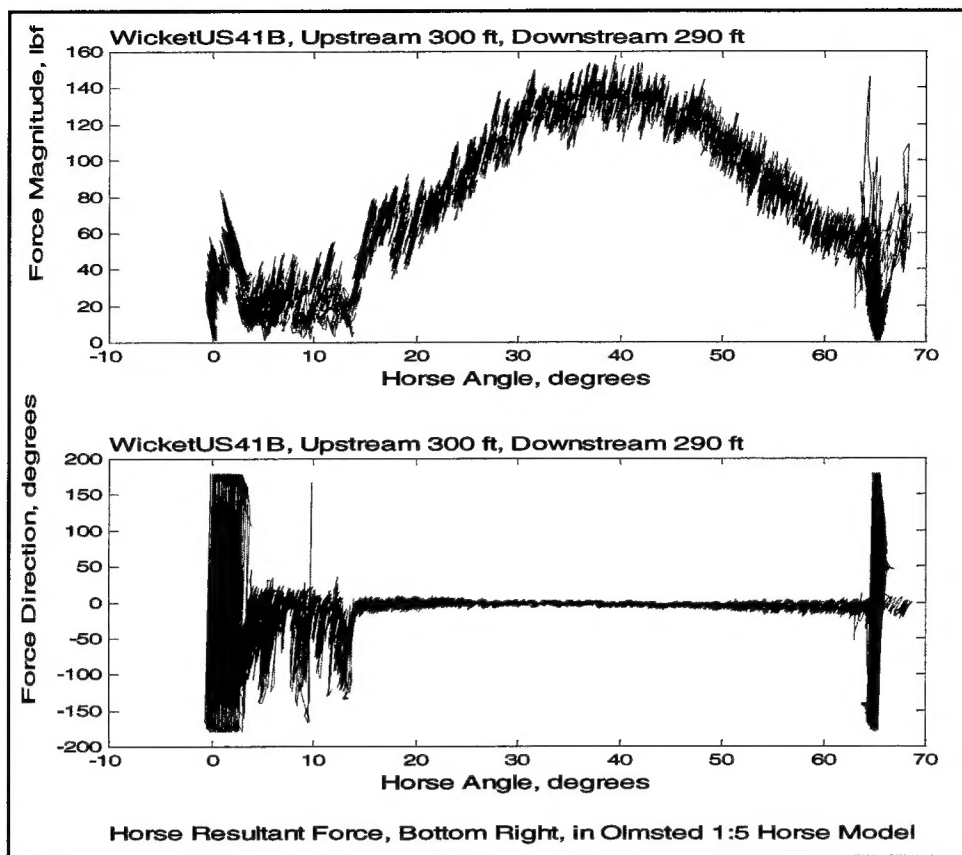


Figure C59. Horse resultant force, bottom right-Bottom-lift drop test-no gap (WicketUS41B)

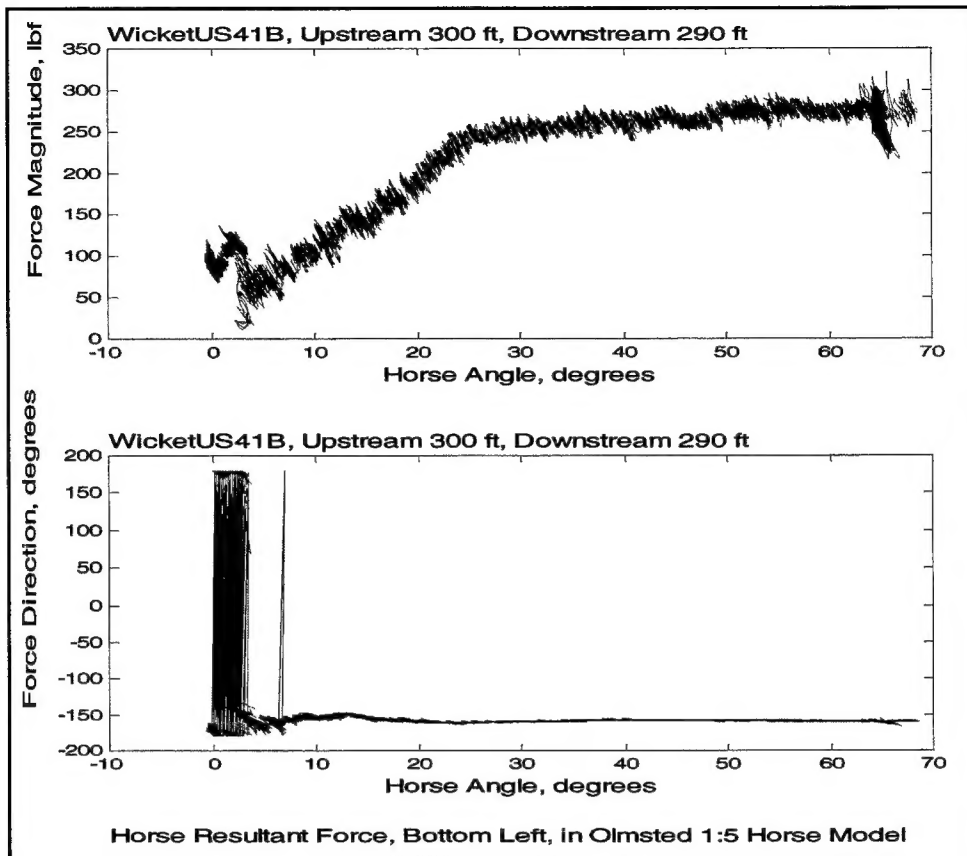


Figure C60. Horse resultant force, bottom left-Bottom-lift drop test-no gap (WicketUS41B)

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The experimental results proposed for the Olmsted Dam operations of the horse wicket in the 1:5-scale hydraulic models are presented in this document. The results of this model investigation provide guidance to design necessary equipment and appurtenances for horse wicket operations in the field. The horse wicket will be used in a 1,400-ft-wide navigable pass of the Olmsted Dam. No significant operational problem was discovered during the normal dam operations investigated in this study. Flipping of the bottom-held wicket for which the bottom of the wicket was pushed down to flip the wicket into its up position must be restricted to reduce inelastic deformation of the wicket components.

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